DOCUMENT RESUME

ED 101 145 95 CE 002 897

AUTHOR Westbrook, Bert W.; Parry-Hill, Joseph W., Jr.
TITLE The Construction and Validation of a Measure of Vocational Maturity. Center Technical Paper No. 16.
INSTITUTION North Carolina State Univ., Raleigh. Center for Occupational Education.
SPONS AGENCY Office of Education (DHEW), Washington, D.C.
BUREAU NO BR-7-0348
PUB DATE 73
GRANT OEG-2-7-0348-2698
NOTE 102p.

EDRS PRICE MF-$0.76 HC-$5.70 PLUS POSTAGE
DESCRIPTORS *Test Construction; *Tests; *Test Validity; *Vocational Maturity
IDENTIFIERS Cognitive Vocational Maturity Test; CVMT

ABSTRACT

The Cognitive Vocational Maturity Test (CVMT) was constructed to measure knowledge and abilities dealing with the characteristics and requirements of a wide range of occupations. Fifteen cognitive vocational maturity areas were identified; the present form of the test consists of 120 multiple choice items, whose reading grade levels range from 1.4 to 2.2, comprising subtests for six of these areas: fields of work; job selection, work conditions, education required, attributes required, and duties. The CVMT was administered to a standardization sample of 7,367 North Carolina students in grades 6-9. Relatively high Kuder-Richardson coefficients for each grade on each of the six area subtests, and the standard errors of measurement, indicate a high level of reliability. Validity is indicated by the higher mean scores on all subtests obtained by students who chose occupations in agreement with their field of interest and aptitude level. Mean scores on all area subtests increased across grade levels, thus providing support for the claim that cognitive vocational maturity behaviors are developmental ones. The CVMT itself and an examiner's manual are included in the document. Also appended are the supportive data from the item analysis and reliability testing phases of the development of the test. (SA)

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THE CONSTRUCTION AND VALIDATION OF A MEASURE OF VOCATIONAL MATURITY

Bert W. Westbrook
Joseph W Parry-Hill, Jr

Department of Psychology
North Carolina State University at Raleigh

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Center Technical Paper No. 16

CE 002 897

CENTER FOR OCCUPATIONAL EDUCATION
North Carolina State University at Raleigh

1973

Project No. 7-0348
Grant No. OEG-2-7-0348-2698

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JOHN K. COSTER, DIRECTOR

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PREFACE

This report serves as an interim report of a project to construct and validate a test to measure variables within the cognitive domain of vocational maturity. At this stage in the project, the test measures only six of 15 areas in the cognitive domain of vocational maturity. The usefulness of a vocational maturity measure such as the Cognitive Vocational Maturity Test described in this report should be judged by reviewing the accumulated research data describing the performance of the instrument in a variety of settings. One of the major goals of this report is to describe the development and characteristics of the test, based upon the data which are presently available. Users of the test are strongly encouraged to undertake relevant research studies at the local level in seeking more specific data concerning the functional characteristics of the tests.

The authors and the Center would like to express gratitude to Professor Donald E. Super of Columbia University for his generous support and many helpful suggestions. His theoretical formulations and research activities provided the primary inspiration for this project. A special note of appreciation is extended to Dr. Joseph R. Clary, who contributed materially to the development of the project, particularly in the initial planning of the study and in its conceptualization.

Extensive data collection from several thousand public school pupils was admirably facilitated by Dr. William J. Brown, Jr., Director of the Division of Research, and his staff in the North Carolina Department of Public Instruction. We wish to express appreciation to the administrators, teachers, and pupils in the participating school districts who took part in the item-analysis research program and the standardization program. A special note of appreciation is extended to the Kannapolis City School System for its cooperation in the conduct of the validation studies program.

The Center is indebted to Dr. Westbrook and Mr. Parry-Hill for their work in preparing this report. Thanks are also extended to Mrs. Sue King for editing the manuscript, to Mrs. Olive Maynard for typing the final copy, and to the entire Center clerical and technical staff for their efforts toward the production of this paper.

John K. Coster
Director

SUMMARY

Procedures are described which were used to develop an instrument to measure an individual's level of cognitive vocational maturity in six areas. The resulting instrument consists of 120 multiple-choice items which cover six areas: Fields of Work, Job Selection, Work Conditions, Education Required, Attributes Required, and Duties. Data are presented indicating the instrument's reliability and validity. Pupils whose vocational choice was in agreement with their field of interest and their aptitude level scored higher on all subtests than pupils whose choice agreed with neither their interests nor their aptitudes. Mean scores on all area subtests increased across grade levels, thus providing support for the claim that cognitive vocational maturity behaviors are developmental ones.

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INTRODUCTION

Vocational maturity has come into fairly wide use as a factor of some significance in the vocational adjustment of youth (Super, 1953, 1955, 1957; Super and Overstreet, 1960; Crites, 1965, 1969; Gribbons and Lohnes, 1968). Research to date testifies to the importance of the concept (Osipow, 1968), but its use has been restricted by a lack of objective, reliable, and valid instruments for measuring it (Westbrook and Cunningham, 1970). The Indices of Vocational Maturity (Super and Overstreet, 1960) and the Readiness for Vocational Planning Scales (Gribbons and Lohnes, 1968) employ interview procedures which are impractical for large-scale testing because collecting the data is time-consuming and scoring requires the use of highly qualified counselors (Super, 1969).

The construct of vocational maturity includes behaviors in both the cognitive (Bloom, 1956) and affective (Krathwohl et al., 1964) domains. Variables such as Problem-Solving, Planning, Occupational Information, Self-Knowledge, and Goal Selection (Crites, 1965) cover knowledges and abilities in the cognitive domain of vocational maturity, while variables such as Involvement, Orientation, Independence, Preference, and Conception (Crites, 1965) can be classified in the affective domain. Although objective scales have been constructed to measure variables in the affective domain (Crites, 1965; Sheppard, 1971), standardized tests have not yet become available for assessing knowledges and abilities within the cognitive domain. Researchers have relied heavily upon Crites' Attitude Scale (1965) as a measure of vocational maturity. The results of research with that scale and with other noncognitive indices of vocational maturity have led some investigators (Bohm, 1966; Bartlett, 1971) to view vocational maturity development as merely an aspect of personality development. It is possible that different conclusions might be drawn from research studies of cognitive vocational maturity, considered by many (Super and Overstreet, 1960; Crites, 1965; and Gribbons and Lohnes, 1968) to be an important component of vocational maturity. The contention that cognitive processes account for a substantial proportion of the variance in vocational maturity scores is supported by a recent study (Westbrook, Parry-Hill, and Woodbury, 1971) which reported a correlation of .76 between an experimental measure of cognitive vocational maturity and the Readiness for Vocational Planning Scales (Gribbons and Lohnes, 1968), a vocational maturity instrument known to have some predictive validity. This report describes the development and validation of the Cognitive Vocational Maturity Test (CVMT), an instrument designed to provide separate measures of six variables within the cognitive domain of vocational maturity.

DEVELOPMENT AND CHARACTERISTICS OF THE TEST

The Cognitive Vocational Maturity Test was constructed to measure knowledges and abilities dealing with the characteristics and requirements of a wide range of occupations. It should be emphasized that the test does not attempt to measure attitudes toward work, participation in activities which facilitate career development, or other dimensions of vocational maturity which may be equally important in the career development of pupils. In developing the CVMT, consideration was given to practical features facilitating its use. Ease of administration and scoring was a major objective to be met. In addition, an effort was made to produce an instrument which could be easily administered in two 45-minute class periods.

The first task in undertaking the development of the CVMT was to identify areas of cognitive vocational maturity for which measures could be constructed. The Indices of Vocational Maturity by Super and Overstreet (1960), the Readiness for Vocational Planning Scales by Gribbons and Lohnes (1968), and the construct of vocational maturity proposed by Crites (1965) served as the basic sources for identifying the following cognitive vocational maturity areas:

1. Fields of Work - knowledge of the occupations that are available in various fields of work.

2. Job Selection - the ability to choose the most realistic occupation for a hypothetical student who is described in terms of his abilities, interests, values, etc.

3. Work Conditions - knowledge of work schedules, income level, physical conditions, job locations, etc.

4. Education Required - knowledge of the amount of education generally required for a wide range of occupations.

5. Attributes Required - knowledge of the abilities, interests, and values generally required for various occupations.

6. Duties - knowledge of the principal duties performed in various occupations.

7. General Career Information - knowledge of sources of career information and decision-making principles.

8. Associates - knowledge of the type of associates one works with on the job.

9. Planning - knowledge of the sequence of steps one must take to enter specific occupations.

10. Trends - knowledge of the employment trends nationally and in different industries and of the impact of technological changes upon occupations.

11. Alternative Careers - knowledge of which occupations require similar abilities and skills and, thus, represent options for transfer.

12. Individual Attribute Concepts - knowledge and understanding of concepts used to describe individual attributes such as abilities, interests, values, personality, etc.

13. Courses and Curricula - knowledge and understanding of school courses and curricula, their relation to individual attributes, and their relation to occupations.

14. Career Conflicts - the ability to resolve conflicts between factors in vocational choice.

15. Employment-Seeking Skills - knowledge of employment-seeking skills and job success factors.

Specifications

External time requirements imposed upon the test constructor directed that testing time for the final form of the CVMT would have to be limited to two class periods of approximately 45 minutes each. Since 15 minutes were reserved for giving directions each period, the actual total testing time available was 60 minutes. Preliminary tryouts of items suggested that approximately 30 seconds would be required to answer each item. Consequently, plans were made for the construction of a final form containing 120 items. Since the test was designed to provide area subtest scores for individuals, an effort was made to establish a reliability of approximately .85 for each separate part. In order to achieve a minimum reliability of .85 for each area subtest, the minimum number of items for each area subtest was estimated to be approximately 20. Therefore, a maximum of six area subtests could be included in the CVMT.

The six areas that were judged to be most relevant to the objectives of career exploration programs were Fields of Work, Job Selection, Work Conditions, Education Required, Attributes Required, and Duties. These six areas represent the portion of the cognitive domain of vocational maturity within which the CVMT is designed to function.

Each of the six CVMT areas included a representative coverage of occupational categories. Roe's occupational classification system (1956) was used for this purpose because it covers a wide range of occupations classified into eight occupational interest fields: service, business contact, organization, technology, outdoor, science, general cultural, and arts and entertainment.

Development of the Item Analysis Research Form

Items for the Item Analysis Research Form (not included in this report) were prepared from the specifications. Forty-eight occupations were selected for each of the first five area subtests by sampling six occupations from each of the eight Roe occupational interest fields. The sixth area subtest, Duties, contained a total of 72 occupations, nine from each of the eight interest fields.

Using the Dictionary of Occupational Titles (1965) and the Occupational Outlook Handbook (1968-69) as sources of information about the characteristics and requirements of occupations, multiple-choice items were constructed for each of the selected occupations. Table 1 shows the actual number of items in each area subtest comprising the original item pool.

Table 1. Number of Items, Classified by Area Subtest, in Original Item Pool and in Item-Analysis Research Form

Area Subtest	Original Item Pool	Item-Analysis Research Form
1. Fields of Work	48	35
2. Job Selection	48	35
3. Work Conditions	48	35
4. Education Required	48	35
5. Attributes Required	48	35
6. Duties	72	63
Total	312	238

The 312 items which comprised the original item pool were reviewed from three points of view: (a) technical, with particular attention to principles of measurement, including those relating to item form; (b) subject matter, with attention to appropriateness of content and to accuracy of the scoring key; and (c) editorial, with attention to appropriate overall format and to editorial consistency from one item to another. Different reviewers were used for the three different purposes. The 238 items that survived the review process constituted the item-analysis research form and were organized into two booklets, each suitable for administration in two class periods of approximately 45 minutes each. One booklet contained items for the areas identified as Fields of Work, Job Selection, and Work Conditions. The other booklet contained items for Education Required, Attributes Required, and Duties.

Development of the Final Form

In February, 1970, the item-analysis research form of the CVMT was administered to pupils enrolled in 21 North Carolina school systems of various sizes (enrollment) and socioeconomic levels. Table 2 indicates the number of pupils tested. Design of the research program was such that item statistics for Fields of Work, Job Selection, and Work Conditions were based upon 1019 sixth-graders, 2207 seventh-graders, and 2044 eighth-graders. Item statistics for Education Required, Attributes Required, and Duties were based upon 991 sixth-graders, 2124 seventh-graders, and 2073 eighth-graders. In most cases, the tests were administered by regular classroom teachers.

Table 2. Number of Pupils Tested by Grade Level in Item-Analysis Research Program

Grade	Booklet #1			Booklet #2		
	Fields Of Work	Job Selection	Work Conditions	Education Required	Attributes Required	Duties
6	1019	1019	1019	991	991	991
7	2207	2207	2207	2124	2124	2124
8	2044	2044	2044	2073	2073	2073
Total	5270	5270	5270	5188	5188	5188

All tests were scored electronically by the IBM 1230 Optical Mark Scoring Reader. Item difficulty and discrimination indices were derived using the point-biserial correlation coefficient between each item and its subtest score. The rationale for using the point-biserial correlation is that it tells more about the contribution from the particular item to the predictive validity of the test than does the biserial correlation (Guilford, 1965).

Selection of items for the final form of the CVMT was based upon data obtained from the item-analysis research program. Items with discrimination indices (item-subtest correlations) below .30 were eliminated. Items comprising each area subtest were arranged in order of increasing difficulty. Table 3 indicates the number and percentage of items in each area subtest on the final form of the test. The final form of the CVMT is shown in Appendix B.

Table 3. Number of Items, Classified by Area Subtest, in Final Form of Cognitive Vocational Maturity Test

Area Subtest	Number	Percent	Item Numbers
1. Fields of Work	20	16.6	1-20
2. Job Selection	15	12.5	21-35
3. Work Conditions	20	16.6	36-55
4. Education Required	20	16.6	56-75
5. Attributes Required	20	16.6	76-95
6. Duties	25	20.8	96-120
Total	120	99.7	

Reading Level Analysis

Performance on cognitive measures such as the CVMT is frequently characterized as depending, to a large extent, upon the general reading proficiency of the examinee. The principal argument in support of this opinion is that such measures assess little more than basic reading comprehension skills. Thus, such tests are said to be biased in favor of those examinees who possess these skills to the greatest degree. The format of the CVMT is such that all items impose certain reading demands on the examinee. Although most items include only one short item stem, the 15 items in the Job Selection subtest contain stems which are seven to nine lines in length. Therefore, it might seem that the test relies greatly upon reading ability. A special analysis was undertaken to determine the precise reading demands of the test.

All items were analyzed separately in terms of the stem words and the responses. Each word, excluding articles, was located by grade level in Taylor, Frackenpohl, and White's A Revised Core Vocabulary (Educational Development Laboratories, Inc., 1969). The results of this tabulation are shown in Table 4. Most words fall at the preprimer and first-grade levels on the "core" list. Grade levels indicate the point where the various words were typically introduced in the various reading materials surveyed by these investigators. The results of this analysis also revealed the following median grade levels for the various area subtests: Fields of Work, 1.7; Job Selection, 1.4; Work Conditions, 2.1; Education Required, 2.2; Attributes Required, 2.1; and Duties, 2.1.

Table 4. Reading Level Analysis of Words in Career Knowledge Test

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Subtest	Percent of Words at Each Grade Level															
	Pre-primer	1	2	3	4	5	6	7	8	9	10	11	12	13+	Indeterminate	Total Words Analyzed	Medium Grade Level
Fields of Work	30.0	26.0	16.0	2.0	3.0	3.5	5.0	3.0	0.7	0.3	8.0	1.0		0.6	0.9	384	1.7
Job Selection	35.1	31.1	9.2	7.0	4.0	4.5	5.0	1.0	0.5	0.1	1.3	--			1.2	1330	1.4
Work Conditions	21.5	22.5	22.5	6.0	7.4	4.0	10.0	1.0	0.3		3.0	0.3			1.5	356	2.1
Education Required	18.8	26.0	11.6	4.0	8.0	8.9	13.9	1.0	2.0		4.0	--		0.3	1.5	358	2.2
Attributes Required	23.2	23.3	17.1	5.0	9.0	5.0	10.0	1.5	0.5		4.0	0.2			1.2	446	2.1
Duties	27.0	20.3	11.0	8.0	10.0	7.0	7.0	3.0	3.0	0.5	2.0	0.7		0.3	0.2	666	2.1

Examiner's Manual

An examiner's manual was prepared to describe completely and specifically the standard procedures to be followed in administering the CVMT. The manual appears in Appendix H.

STANDARDIZATION

In May, 1971, the final form of the CVMT was administered to a total standardization sample of 7,367 North Carolina public school pupils who were enrolled in a statewide career exploration program for grades 6-9. The actual number of pupils tested in each grade is shown in Table 5. In most cases, regular classroom teachers or guidance counselors administered the tests. All tests were scored electronically by the IBM 1230 Optical Mark Scoring Reader. The 40 participating school systems shown in Appendix A represent systems of various sizes (enrollment), socioeconomic levels, and geographic regions. Summary statistics are presented in Appendix C.

Summary item-analysis data for each area subtest on the CVMT final form are shown in Table 6. The data were obtained from the complete standardization sample at each grade level. These data represent a cross-validation of the original item statistics, since the sample was independent of that used for determination of the values used in initial item selection. A complete set of item statistics is presented in Appendices D-G.

Table 5. Means and Standard Deviations for Total Standardization Sample on Cognitive Vocational Maturity Test

Area Subtest	Grade	N	Mean	S.D.
1. Fields of Work	6	1398	11.67	4.60
	7	2384	12.92	4.48
	8	2659	14.47	4.15
	9	926	15.88	3.40
2. Job Selection	6	1398	6.38	3.02
	7	2384	7.29	3.14
	8	2659	8.53	3.18
	9	926	9.73	2.87
3. Work Conditions	6	1398	12.58	4.78
	7	2384	13.79	4.58
	8	2659	15.27	4.33
	9	926	16.90	3.30
4. Education Required	6	1398	9.90	4.41
	7	2384	11.37	4.47
	8	2659	13.05	4.45
	9	926	14.91	3.62
5. Attributes Required	6	1398	10.21	5.32
	7	2384	11.91	5.30
	8	2659	13.77	5.12
	9	926	15.55	4.15
6. Duties	6	1398	11.50	6.19
	7	2384	13.46	6.52
	8	2659	15.78	6.63
	9	926	18.40	5.52

Table 6. Median Item Difficulty[1] and Discrimination[2] Indices for Cognitive Vocational Maturity Test

Area Subtest	No. of Items	Grade 6		Grade 7		Grade 8		Grade 9	
		Diff.	Disc.	Diff.	Disc.	Diff.	Disc.	Diff.	Disc.
1. Fields of Work	20	.61	.50	.69	.50	.77	.50	.84	.46
2. Job Selection	15	.45	.44	.52	.43	.61	.44	.71	.43
3. Work Conditions	20	.61	.53	.70	.52	.77	.53	.85	.48
4. Education Required	20	.47	.47	.55	.50	.65	.49	.76	.44
5. Attributes Required	20	.53	.57	.64	.58	.73	.60	.82	.57
6. Duties	25	.45	.53	.53	.55	.65	.57	.74	.53

[1]Percentage answering item correctly in standardization sample.

[2]Item-subtest point biserial correlation.

RELIABILITY

Estimates of test reliability are obtained to establish the precision of a test as a measuring instrument. The observed differences among individuals in terms of their scores earned on a particular test reflect "true" differences with respect to the trait being measured and errors of measurement associated with conditions which are irrelevant to the stated function of the test. The more the observed differences among individuals reflect "true" differences in the ability or function being measured, the greater is the precision of the test in performing that purpose for which it was designed.

The different techniques for estimating test reliability permit one or more types of measurement error to be reflected in the observed scores. For example, an individual's performance may be affected by the particular sample of items used in the test or by temporary health or motivational factors present at the time of testing. Test reliability is typically expressed in terms of the reliability coefficient and the standard error of measurement. The reliability coefficient is more useful for comparing the reliability of different tests, while the standard error of measurement is of greater use in the interpretation of individual scores.

Kuder-Richardson reliability estimates were determined for each grade on each of the six area subtests. In addition, split-half reliability estimates are presently being computed for a sample of pupils in the standardization program.

The most rigorous estimates of test reliability are those based upon the administration of alternate forms on different occasions, since errors of measurement associated both with a particular sample of items and with a particular testing occasion are reflected. However, inasmuch as only one form of the cognitive vocational maturity test was constructed, estimates of alternate forms reliability cannot be determined.

Kuder-Richardson Reliability

Values appearing in Table 7 are estimates of internal consistency reliability based upon the Kuder-Richardson technique which uses data obtained from the performance of each item in the test. This technique is based upon a single administration of the test and does not reflect variations in test performance from one occasion to another. The relatively high Kuder-Richardson coefficients for the single-grade groups indicate the highly homogeneous nature of the six area subtests comprising the Cognitive Vocational Maturity Test.

Table 7. Kuder-Richardson Reliability Coefficients and Standard Errors of Measurement for Total Standardization Sample on Career Knowledge Test

Area Subtest	Grade	N	Mean	S.D.	K-R#20	Standard Errors of Measurement
1. Fields of Work	6	1398	11.67	4.60	.83	1.87
	7	2384	12.92	4.48	.84	1.80
	8	2659	14.47	4.15	.83	1.69
	9	926	15.88	3.40	.79	1.58
2. Job Selection	6	1398	6.38	3.02	.67	1.75
	7	2384	7.29	3.14	.69	1.74
	8	2659	8.53	3.18	.71	1.71
	9	926	9.73	2.87	.67	1.65
3. Work Conditions	6	1398	12.58	4.78	.85	1.85
	7	2384	13.79	4.58	.85	1.77
	8	2659	15.27	4.33	.86	1.61
	9	926	16.90	3.30	.81	1.44
4. Education Required	6	1398	9.90	4.41	.80	1.97
	7	2384	11.37	4.47	.82	1.92
	8	2659	13.05	4.45	.83	1.83
	9	926	14.91	3.62	.78	1.71
5. Attributes Required	6	1398	10.21	5.32	.87	1.89
	7	2384	11.91	5.30	.88	1.81
	8	2659	13.77	5.12	.89	1.67
	9	926	15.55	4.15	.86	1.53
6. Duties	6	1398	11.50	6.19	.88	2.14
	7	2384	13.46	6.52	.90	2.10
	8	2659	15.78	6.63	.91	1.98
	9	926	18.40	5.52	.89	1.86

Standard Error of Measurement

The standard error of measurement concept is useful in the interpretation of individual pupil scores. All standard errors of measurement reported in this document were derived from the Kuder-Richardson reliability data. Values appearing in the last column of Table 7 are standard errors of measurement for each area subtest administered in grades 6-9.

The standard error of measurement provides an estimate of the confidence which may be placed in a given obtained score by indicating the variability in obtained score units that would be expected to occur from testing a single individual a large number of times with the same test. This, of course, assumes that the individual is not changed in any way during this series of repeated measurements. Approximately 2 out of 3 obtained scores will fall within $\pm$ 1 standard error of measurement from their underlying "true" score, while 19 out of 20 obtained scores would fall within $\pm$ 2 standard errors of measurement from their underlying "true" score.

VALIDITY

Various types of data have been gathered for the CVMT to determine whether the test is measuring those behaviors for which it was designed. The process of establishing the validity of any test is an ongoing enterprise that requires the continuous gathering and evaluating of various types of evidence indicative of the performance of the test in a wide variety of specific situations. Users of the CVMT are strongly urged to conduct local validation studies to obtain the most specific and relevant data reflecting local school systems or community characteristics.

The validity of the CVMT may be judged by (1) the extent to which the items comprising the test sample measures the cognitive domain of vocational maturity as defined by the test author, (2) the extent to which the test predicts significant criteria usually associated with cognitive vocational maturity, and (3) the degree to which the test assesses the theoretical construct of vocational maturity. Data relevant to these three basic ways of evaluating the validity of the CVMT are presented and discussed in the following sections.

Content Validity

The CVMT was designed to measure knowledges and abilities within six areas of the cognitive domain of vocational maturity: Fields of Work, Job Selection, Work Conditions, Education Required, Attributes Required, and Duties. Each of the six areas includes occupations in different interest fields. Emphasis is placed upon a knowledge of the characteristics and requirements of a wide range of occupations. The ability to make appropriate occupational choices for a hypothetical student is also stressed.

Some discussion has already been devoted to the basic rationale underlying the construction of the test. Super's Indices of Vocational Maturity, Gribbons and Lohnes' Readiness for Vocational Planning Scales, and Crites' construct of vocational maturity were all used in an attempt to define somewhat more precisely the cognitive vocational maturity behaviors which the test attempts to assess. Examination of the proportion of items in each area subtest of the CVMT indicates specifically the scope of the knowledges and abilities measured and serves as a basis for determining the extent to which these knowledges and abilities are appropriate as measures of cognitive vocational maturity.

Criterion-Related Validity

Criterion-related validity refers to establishing the relationship between scores obtained on a given test and those obtained on other specific external criterion measures generally associated with the attribute measured by the test. Measures of vocational maturity such as the

CVMT can be used to assess readiness for vocational planning if it can be demonstrated that test scores serve as indicators of the pupil's ability to make appropriate vocational choices. The pupil whose vocational choice is both in his field of interest and on the appropriate aptitude level should score higher on the CVMT than the pupil whose choice agrees with neither his field of interest nor his level of aptitude.

The criterion-related validity data were obtained from a sample of 249 ninth-grade pupils enrolled in a medium-sized Piedmont school in North Carolina with average socioeconomic status. In May, 1971, each pupil was administered the CVMT, the Kuder-Preference Record--Form C, the California Test of Mental Maturity, and Trow's (1941) Vocational Choice Inventory. Using the system proposed by Crites (1969b) to operationally define agreement of choice with aptitude and interest, pupils with adjusted choices and those with maladjusted choices were identified. Adjusted pupils are those whose vocational choice is in the field of their interest and on the appropriate aptitude level. Maladjusted pupils are those whose choices agree with neither their field of interest nor their level of aptitude. Of the 249 pupils in the criterion sample, 26 had adjusted choices, 117 had maladjusted choices, and 116 made choices which were in agreement with their interests or with their aptitudes, but not both. Table 8 shows that the adjusted group attained significantly higher means on all area subtests and on the total test than did the maladjusted group.

Table 8. Means, Standard Deviations, and t Tests for the Adjusted and Maladjusted Group on the CVMT (Grade 9)

Area Subtest	Adjusted Vocational Choice Group (N = 26)		Maladjusted Vocational Choice Group (N = 117)		t
	Mean	S.D.	Mean	S.D.	
Fields of Work	17.31	3.38	15.26	3.78	2.54**
Job Selection	11.31	2.45	9.18	3.07	3.31**
Work Conditions	17.92	4.04	16.05	3.74	2.27*
Education Required	16.27	3.19	14.51	3.80	2.19*
Attributes Required	17.38	3.36	14.44	4.95	2.88**
Duties	21.23	5.16	17.26	6.11	3.08**
Total Test	101.42	19.35	86.71	22.17	3.13**

*$p < .05$, one-tailed test.

**$p < .01$, one-tailed test.

In a second analysis, pupils in the criterion-related validity sample were reclassified on the basis of agreement between choice and interest only. In this analysis, aptitude level was not taken into account. Pupils whose vocational choice was in the field of their highest interest on the Kuder Preference Record comprised the congruent vocational choice interest group. The incongruent vocational choice interest group consisted of all pupils whose vocational choice was in a field other than their highest interest. As can be seen from Table 9, the mean scores for the congruent group are significantly higher on all area subtests and on the total test than the mean scores for the incongruent group.

Table 9. Means, Standard Deviations, and t Tests for Congruent and Incongruent Vocational Choice-Interest Groups on Cognitive Vocational Maturity Test (Grade 9)

Area Subtest	Congruent Vocational Choice-Interest Group (N = 42)		Incongruent Vocational Choice-Interest Group (N = 207)		t
	Mean	S.D.	Mean	S.D.	
Fields of Work	16.71	3.30	15.62	3.64	1.81*
Job Selection	10.90	2.31	9.45	2.90	3.06**
Work Conditions	17.88	2.52	16.40	3.71	2.47**
Education Required	15.79	2.98	14.76	3.77	1.65*
Attributes Required	16.81	3.33	15.13	4.62	2.24*
Duties	20.50	3.90	18.00	5.75	2.69**
Total Test	98.60	15.75	89.37	21.27	2.67**

*$p < .05$, one-tailed test.

**$p < .01$, one-tailed test.

Construct Validity

Studies undertaken to establish the construct validity of a particular measuring instrument are concerned principally with investigating the extent to which scores obtained on that device indicate the presence of a specific psychological trait. Techniques commonly used to establish the validity of various kinds of psychological tests include obtaining correlations between the test in question and other relevant tests for which the interpretation is relatively clear and conducting special

studies to test hypotheses concerning a given trait or psychological theory. Any relevant data that help to define more clearly just what is being measured by a specific test constitute appropriate evidence of construct validity.

As stated earlier, the CVMT was designed to assess selected variables within the cognitive domain of vocational maturity. In the development of the test, cognitive vocational maturity was defined as consisting of 15 areas of career knowledges and abilities which must be used in the process of making appropriate vocational choices. The CVMT measures five of those cognitive variables important for successful career development. The pupil whose vocational choice is in the field of his interest and is on the appropriate aptitude level should score higher on the CVMT than the pupil whose choice agrees with neither his field of interest nor his level of aptitude. Other data presented in this report are relevant in establishing construct validity, particularly the data concerning reading level. In a sense, all of the data previously presented in this report are of some importance in attempting to delimit more precisely just what the CVMT is measuring.

The construct validity of the CVMT was studied by obtaining correlation between the test and a measure of mental ability, by obtaining intercorrelations among the CVMT area subtests, and by examining the mean CVMT scores across grade levels.

Table 10 presents the correlations between the California Test of Mental Ability and the various subtests and total score of the CVMT.

Table 10. Correlation Between Cognitive Vocational Maturity Test and California Test of Mental Maturity

CTMM IQ Scores		CVMT Raw Scores			r
Mean	S.D.	Area Subtest	Mean	S.D.	
98.27	14.88	Fields of Work	15.80	3.60	.59
		Job Selection	9.69	2.85	.57
		Work Conditions	16.65	3.57	.53
		Education Required	14.94	3.67	.60
		Attributes Required	15.41	4.47	.63
		Duties	18.42	5.55	.69
		Total	90.92	20.71	.70

Data for the California Test of Mental Maturity were obtained from pupils comprising the criterion-related validity sample described earlier in this report. The obtained CVMT and mental ability correlations range from the low .50's to the high .60's for the area subtests. Mental ability is least related to Work Conditions (.53) and most highly related to Duties (.69).

The intercorrelations of the six area subtests and their correlation with the total score for grades 7, 8, and 9 are shown in Table 11. The data are based upon the results obtained from the standardization sample of the CVMT. The pattern and size of the correlations are similar across grade levels; the area subtest intercorrelations are, with only one exception, in the .60's and .70's while the correlations between area subtests and total scores are, with only one exception, in the .80's and .90's. Each area subtest was correlated with the total minus that particular area subtest.

The data presented in Table 5 show that the mean CVMT scores increase systematically across the four grade levels employed in the standardization sample. The increase in mean scores occurred on all six subtests of the CVMT.

Table 11 Intercorrelation of Cognitive Vocational Maturity Test Area Subtests

Area Subtest	Fields of Work	Job Selection	Work Conditions	Education Required	Attributes Required	Duties
Grade 7 of Standardization Sample (N = 2348)						
Fields of Work						
Job Selection	.67					
Work Conditions	.71	.65				
Education Required	.70	.66	.77			
Attributes Required	.71	.68	.74	.77		
Duties	.73	.70	.72	.76	.84	
Total	.86	.80	.87	.88	.91	.92
Grade 8 of Standardization Sample (N = 2659)						
Fields of Work						
Job Selection	.68					
Work Conditions	.71	.67				
Education Required	.69	.69	.77			
Attributes Required	.69	.68	.75	.78		
Duties	.72	.69	.73	.77	.84	
Total	.84	.82	.87	.89	.91	.92
Grade 9 of Standardization Sample (N = 926)						
Fields of Work						
Job Selection	.64					
Work Conditions	.63	.58				
Education Required	.64	.61	.74			
Attributes Required	.67	.61	.71	.73		
Duties	.69	.67	.69	.70	.81	
Total	.82	.78	.84	.86	.90	.91

DISCUSSION

Essentially, the CVMT measures career knowledges and abilities within six areas of the cognitive domain of vocational maturity. Emphasis is placed upon a knowledge of the characteristics and requirements of a wide range of occupations. The ability to select the most realistic occupation for a hypothetical individual who is described in terms of abilities, interests, and values is also included.

Examination of the proportions of items within each area of the CVMT indicates the scope of the knowledges and abilities measured, and serves as a basis for determining the extent to which these knowledges and abilities are appropriate as measures of variables in the cognitive domain of vocational maturity.

Special care was taken in the development of the test to ensure that reading ability per se was not a major source of variance in the test scores. Median grade levels determined for the various subtests suggest that the CVMT is not heavily dependent upon reading skills. Apparently, reading ability, beyond a minimal level, is not of primary importance in responding to the test items. Thus, the test measures the examinee's knowledge of the requirements and characteristics of occupations and not sheer reading comprehension skills.

Kuder-Richardson reliability estimates were determined for each grade on each of the six area subtests. The relatively high coefficients for the single-grade groups indicate the highly homogeneous nature of the six area subtests comprising the CVMT. The standard errors of measurement suggest that a high degree of confidence may be placed in the obtained scores on most of the area subtests.

Pupils who chose occupations in their field of interest and on the appropriate aptitude level attained higher mean scores on all subtests of the CVMT than did pupils whose choices agreed with neither their field of interest nor their level of aptitude. Pupils with greater knowledge of the characteristics and requirements of occupations made more appropriate vocational choices than did pupils with less knowledge. These results do not provide conclusive evidence about the validity of the CVMT, but they do suggest that the test measures some aspect of vocational maturity which is associated with an individual's ability to make appropriate vocational choices. The CVMT could be used in studies to determine whether increases in vocational maturity are accompanied by increases in ability to make appropriate vocational choices.

In view of the cognitive nature of the CVMT, it would seem reasonable to expect a substantial relationship between scores obtained on the CVMT and those obtained on measures of mental ability. One would, however, expect the relationship to be far from perfect, since mental ability

measures are designed to assess abstract reasoning abilities. The CVMT, on the other hand, has been developed primarily to assess knowledge of the characteristics and requirements of a wide range of occupations. The size of the correlation coefficients for the area subtests indicates that while the mental ability test and the CVMT do measure some common abilities, considerable variance remains which is specific to each measure.

In selecting tests for a composite scale, common practice suggests that the subtests correlate more highly with the total score (criterion) than they do with each other. This is based upon the theory that a high correlation with total score indicates that the tests contribute to the measurement of a general factor while the lower subtest intercorrelations imply that the tests measure different aspects of the criterion. Data collected from the standardization sample indicate that the subtests of the CVMT are in accord with this expectation.

Since theories of vocational development propose that vocational behaviors mature with increasing age and grade during adolescence, measures of vocational maturity should yield scores which increase with grade (Crites, 1965). In the development of the CVMT, item selection was based upon item-subtest correlation for single-grade groups rather than item difficulty across grade levels so that the test could be used in studies of the developmental nature of vocational maturity (Westbrook, 1971). The CVMT was administered to samples of pupils in grades six through nine and, as Table 2 shows, the mean scores on each area subtest increase monotonically with grade levels. This finding tends to support the claim that cognitive vocational maturity behaviors are developmental ones and to strengthen the argument about the construct validity of vocational maturity.

The usefulness of a vocational maturity measure such as the CVMT described in this report should be judged by reviewing the accumulated research data describing the performance of the instrument in a variety of settings. The data contained in this report are based upon samples of pupils enrolled in various types of schools which participated in a state-wide career exploration program. The data are specific to the particular school systems from which they were obtained and may not necessarily apply to school systems with characteristics which differ markedly from those of the school systems participating in the reported studies. Additional studies are needed to evaluate the performance of the test with respect to other measures and other samples of pupils not included in the present studies. Users of the test are strongly urged to undertake relevant research studies at the local level in seeking more specific data concerning the functional characteristics of the test.

REFERENCES

Bartlett, W. E. "Vocational Maturity: Its Past, Present and Future Development." Journal of Vocational Behavior, I(1971), pp. 217-229.

Bloom, B. S. (ed.). Taxonomy of Educational Objectives: Cognitive Domain. New York: David McKay, 1956.

Bohn, M. J. "Vocational Maturity and Personality." Vocational Guidance Quarterly, XV(1966), pp. 123-126.

Crites, J. O. "Measurement of Vocational Maturity in Adolescence: I. Attitude Test of Vocational Development Inventory." Psychological Monographs, No. 595 (1965).

Crites, J. O. The Maturity of Vocational Attitudes in Adolescence. Iowa City, Iowa: J. O. Crites, 1969.

Crites, J. O. Vocational Psychology. New York: McGraw-Hill Book Company, Inc., 1969.

Gribbons, W. D., and P. R. Lohnes. Emerging Careers. New York: Teachers College, Columbia University, 1968.

Guilford, J. P. Fundamental Statistics in Psychology and Education. New York: McGraw-Hill Book Company, Inc., 1965.

Krathwohl, D. R., B. S. Bloom, and B. B. Masia. Taxonomy of Educational Objectives: Affective Domain. New York: David McKay, 1964.

Osipow, S. H. Theories of Career Development. New York: Appleton-Century-Crofts, 1968.

Roe, A. The Psychology of Occupations. New York: John Wiley and Sons, Inc., 1956.

Sheppard, David I. "The Measurement of Vocational Maturity in Adults." Journal of Vocational Behavior, I(1971), pp. 399-406.

Super, D. E. "A Theory of Vocational Development." American Psychologist, VIII(1953), pp. 185-190.

Super, D. E. "The Dimensions and Measurement of Vocational Maturity." Teachers College Record, LVII(1955), pp. 151-163.

Super, D. E. "Vocational Development Theory in 1988: How Will It Come About?" Counseling Psychologist, I(1969), pp. 9-14.

Super, D. E., J. O. Crites, R. C. Hummel, H. P. Moser, P. L. Overstreet, and C. F. Warmath. Vocational Development: A Framework for Research. New York: Teachers College, Columbia University, 1957.

Super, D. E., and P. L. Overstreet. The Vocational Maturity of Ninth-Grade Boys. New York: Teachers College, Columbia University, 1960.

Taylor, S. E., H. Frackenpohl, and C. E. White. A Revised Core Vocabulary. Huntington, New York: Educational Development Laboratories, 1969.

Trow, W. D. "Phantasy and Vocational Choice." Occupations, XX(1941), pp. 89-93.

U. S. Department of Labor. Dictionary of Occupational Titles, Volume I. Washington, D. C.: U. S. Government Printing Office, 1965.

U. S. Department of Labor. Occupational Outlook Handbook. Washington, D. C.: U. S. Government Printing Office, 1968-69.

Westbrook, B. W. Toward the Validation of the Construct of Vocational Maturity. Technical Paper No. 6. Raleigh, North Carolina: Center for Occupational Education, North Carolina State University, 1971.

Westbrook, B. W. and J. W. Cunningham. "The Development and Application of Vocational Maturity Measures." Vocational Guidance Quarterly, (1970), pp. 171-175.

Westbrook, B. W., J. W. Parry-Hill, and R. W. Woodbury. "The Development of a Measure of Vocational Maturity." Educational and Psychological Measurement, XXXI(1971), pp. 541-543.

APPENDIX A

PARTICIPATING SCHOOL SYSTEMS

School Systems Participating in Standardization Program*

Alamance County
Alleghany County
Anson County
Catawba County
Charlotte/Mecklenburg
Chatham County
Columbus County
Craven County
Cumberland County
Dare County
Davidson County
Davie County
Eden City
Fayetteville City
Gaston County
Greensboro City
Guilford County
Johnson County
Kannapolis City
Laurenburg City
Lenoir County
Lexington City
Madison County
Moore County
Nash County
Newton-Conover City
Northhampton County
Onslow County
Pitt County
Robeson County
Rocky Mount City
Rutherford County
Sampson County
Shelby City
Stokes County
Union County
Watauga County
Wayne County
Wilkes County
Yadkin County

*All are North Carolina school systems.

School Systems Participating in Item Analysis Research Program*

Charlotte-Mecklenburg

Cumberland County

Davie County

Eden City

Gaston County

Greensboro City

Guilford County

Kannapolis City

Lenoir County

Madison County

Nash County

Newton-Conover City

Pitt County

Robeson County

Rocky Mount City

Rutherford County

Sampson County

Stokes County

Washington County

Watauga County

Wayne County

*All are North Carolina school systems.

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APPENDIX B

VOCATIONAL MATURITY BATTERY REVISED FORM
TEST: 1-6

Directions

This is a test of your knowledge of occupational information. The results of this test may eventually be used to help you choose an appropriate occupation.

Your answer must be marked on the answer sheet which has been provided for you. Use only the special pencil that has been provided. Do not make any stray marks! If you make an error, erase it completely before marking your new answer.

Make no marks in the test booklet.

The following is a sample question to show you how your answers are to be marked. Study the sample and if you have any questions, raise your hand.

Sample Question

Which word means the same as begin?

A. read
B. end
C. start
D. work
E. I don't know

On Separate Answer Sheet

	A	B	C	D	E
1.			■		

You should note that your answer sheet is arranged so that the numbers for the response positions go across the answer sheet rather than down one column at a time.

For each question there is always one best answer. You should answer as many questions as you can. Do not spend a great amount of time on any one question.

B. W. Westbrook, Editor
Department of Psychology and
Center for Occupational Education
North Carolina State University at Raleigh
September, 1970

This is an experimental test which is to be used for authorized research purposes. It was constructed as a part of Project Number BR 7-0348 supported by the U. S. Office of Education under contract Number OEG-2-7-070348-2698.

1. Which one of the following is NOT in the field of PUBLISHING?

   A. Editor
   B. Author
   C. Pianist
   D. Printer
   E. I don't know

2. Which one of the following occupations is in the field of AGRICULTURE?

   A. Farmer
   B. Hair Stylist
   C. Housewife
   D. Carpenter
   E. I don't know

3. Which one of the following is NOT in the field of AGRICULTURE?

   A. Laborer
   B. Farmer
   C. Conservationist
   D. Physician
   E. I don't know

4. Which one of the following is NOT in the field of ART?

   A. Illustrator
   B. Typist
   C. Designer
   D. Sculptor
   E. I don't know

5. Which one of the following is NOT in the HOTEL INDUSTRY?

   A. Surveyor
   B. Caterer
   C. Bellboy
   D. Cashier
   E. I don't know

6. Which one of the following is NOT in the field of HEALTH?

   A. Therapist
   B. Physician
   C. Choreographer
   D. Nurse
   E. I don't know

7. Which one of the following occupations is found in the RESTAURANT INDUSTRY?

   A. Chef
   B. Librarian
   C. Machinist
   D. Statistician
   E. I don't know

8. Which one of the following is NOT in the field of AVIATION?

   A. Flight Engineer
   B. Copywriter
   C. Stewardess
   D. Navigator
   E. I don't know

9. Which one of the following is NOT in the field of TRANSPORTATION?

   A. Truck Driver
   B. Stewardess
   C. Mechanic
   D. Architect
   E. I don't know

10. Which one of the following occupations is in the area of LAW ENFORCEMENT?

   A. Accountant
   B. Stockbroker
   C. Firefighter
   D. Judge
   E. I don't know

11. Which one of the following is NOT in the field of PHARMACOLOGY?

   A. Compositor
   B. Bacteriologist
   C. Biologist
   D. Chemist
   E. I don't know

12. Which one of the following is NOT in the field of OFFICE WORK?

   A. Stenographer
   B. Accountant
   C. Bookkeeper
   D. Photographer
   E. I don't know

13. Which one of the following is NOT in the field of EDUCATION?

A. Teacher
B. Lawyer
C. Counselor
D. Principal
E. I don't know

14. Which one of the following is NOT in the field of CONSTRUCTION?

A. Surveyor
B. Architect
C. Carpenter
D. Mechanic
E. I don't know

15. Which one of the following occupations is in the area of OCEANOGRAPHY?

A. Marine Geologist
B. Botanist
C. Anthropologist
D. Archeologist
E. I don't know

16. Which one of the following is NOT in the field of PERSONNEL?

A. Interviewer
B. Veterinarian
C. Personnel Clerk
D. Psychologist
E. I don't know

17. Which one of the following occupations is in the field of SALES?

A. Insurance Broker
B. Bank Clerk
C. Psychologist
D. Craneman
E. I don't know

18. Which one of the following is NOT in the field of ENTERTAINMENT?

A. Musician
B. Therapist
C. Choreographer
D. Acrobat
E. I don't know

19. Which one of the following is NOT in the field of COSMETOLOGY?

A. Seamstress
B. Manicurist
C. Stylist
D. Pedicurist
E. I don't know

20. Which one of the following occupations is a DRIVING OCCUPATION?

A. Auto Mechanic
B. Flame Cutter
C. Routeman
D. Highway Surveyor
E. I don't know

21. James is shy and stays mostly by himself rather than talking with others or entering into games and sports on the playground. He usually goes home right after school and either reads or builds model airplanes. In class he seldom raises his hand to answer questions, but he is one of the best students in his grade. Which occupation would be the best one for him?

A. Engineer
B. Actor
C. Lawyer
D. Salesman
E. I don't know

22. John was an average student in high school but had a hard time in college, where he had chosen economics as his major. He worked part-time at a restaurant during all of his college years and eventually became assistant to the manager. He gets along well with other people and is a good talker. He is now in one of the following occupations. Which one do you think seems the most likely one for him to be in?

A. High School Social Studies Teacher
B. Frozen Food Company Salesman
C. Hotel Manager
D. Restaurant Operator
E. I don't know

23. Mike had some vocational training in high school and worked hard to graduate. He is physically strong and prefers outdoor work. He is good at doing things with his hands, is dependable and cooperative. He likes to be around other people and has a cheerful personality. He is now in one of the following occupations. Which one seems to you to be the most likely one for him to be in?

A. Payroll Clerk
B. Truck Driver
C. Brickmason
D. Night Watchman
E. I don't know

24. Tom did his best high school work in chemistry and biology. He always showed a special understanding and affection for animals and as a child had pets of many kinds. He enjoys outdoor activities at all times of the year and keeps in good physical shape. His college work included work in the physical and biological sciences, and after graduation he went on for the specialized professional training required for his chosen field. He is now in one of the following occupations. Which one seems to you to be the most likely one for him to be in?

A. Animal Trainer
B. Veterinarian
C. Hunting Guide
D. Jockey
E. I don't know

25. Bill likes people and has always been interested in the lives and customs of others. He is friendly and outgoing, but also a good listener. He did well in history and other social science courses in high school and majored in sociology in college. He joined the Peace Corps after graduation, before settling down in a particular job. He is now in one of the following occupations. Which one seems to you to be the most likely one for him to be in?

A. College Professor
B. Playground Director
C. Social Caseworker
D. Town Manager
E. I don't know

26. Bob was always considered to be cooperative and intelligent, and he was well liked by his fellow students. His grades in all subjects were above average, and although he thought he would like to work with young people, he ruled out a teaching career. His friends have always found it easy to talk to him about their problems, and they were not surprised when he went to a School of Social Work for his college degree. He then did graduate work for certification in his chosen field of work. He is now in one of the following occupations. Which one seems to you to be the most likely one for him to be in?

A. YMCA Director
B. School Counselor
C. Police Chief
D. Minister
E. I don't know

27. John has about a "C" average in school. He enjoys being with others, and he has joined several clubs in school. Last year he was chosen as the most popular boy in his class. Which occupation would be the best one for him?

A. Writer
B. Salesman
C. Farmer
D. Engineer
E. I don't know

28. John has a good high school background in mathematics and science. Two of his personal qualities are orderliness and liking for detail. He is a good manager and was elected president of several high school and college organizations. He had part-time summer jobs in a hospital laboratory. He always hoped that someday he could manage a business of his own. Graduation from an accredited specialized college is required for John's chosen occupation, and each state in the country requires a license to practice it. He is now in one of the following occupations. Which one seems to you to be the most likely one for him to be in?

A. Accountant
B. Pharmacist
C. Pilot
D. Lawyer
E. I don't know

29. Jane graduated from a consolidated high school in a rural area. She was active in 4-H programs and especially enjoyed the home management and food processing projects that she worked on. She was very capable at organizing and managing home economics club projects in high school. Her best grades were in chemistry, biology, and mathematics; her poorest ones were in English. She went on to a four-year science program at the state university. She is now in one of the following occupations. Which one seems to you to be the most likely one for her to be in?

A. Food Editor for a Newspaper
B. Dietitian
C. Elementary School Teacher
D. Waitress
E. I don't know

30. Bob is the best athlete in his class, although his grades are quite low. He doesn't like school very much but says that he is going to be a "big businessman" someday. He usually tries to tell the other boys what to do and sometimes gets into fights with them. Which occupation would be the best one for him?

A. Accountant
B. Machinist
C. Lumberjack
D. Minister
E. I don't know

31. Mary graduated from a high school where she was able to take several business courses. English was her poorest subject, but the Dramatic Club was her favorite outside activity. She is a poised and alert girl who likes to be around other people. She is now in one of the following occupations. Which one seems to you to be the most likely one for her to be in?

A. Mail Clerk
B. Receptionist
C. Stenographer
D. Secretary
E. I don't know

32. Ralph enjoys making things, and he works in his father's wood shop whenever he gets the chance. Also, he likes to draw and has quite a collection of pictures. At school, he ranks high in his class, with his best grades in mathematics and physics. Which occupation would be the best one for him?

A. Architect
B. Artist
C. Actor
D. Carpenter
E. I don't know

33. Phil grew up in the country and was always watching things grow. He liked to be out-of-doors and was happiest when he could hunt or fish by himself or with a friend. He did average work in high school and then went to an agricultural college for two years. He is quiet and easygoing, not very mechanically inclined, and has a lot of patience. He is now in one of the following occupations. Which one seems to you to be the most likely one for him to be in?

A. Soil Chemist
B. Farm Implement Salesman
C. Greenhouse and Nursery Operator
D. Foreman in Tomato Packinghouse
E. I don't know

34. John was an above-average student in high school, active in extra-curricular activities, and always in demand for his organizing and directing skills for student government projects. His college work was in accounting and economics, and he went on to graduate school on a grant from the U. S. Public Health Service. He is active in sports, has a lot of vitality, and also has a special skill for public speaking. He is now in one of the following occupations. Which one seems to you to be the most likely one for him to be in?

A. Medical Doctor
B. Pharmacist
C. Hospital Administrator
D. Football Coach
E. I don't know

35. Bill dropped out of high school and worked as a mechanic's helper before deciding to go back to night school for his diploma. He likes cars a lot and likes to travel around to see different places. He is a dependable person and level-headed in emergencies. He is now in one of the following occupations. Which one seems to you to be the most likely one for him to be in?

A. Garage Mechanic
B. Policeman
C. Interstate Bus Driver
D. Automobile Assemblyline Worker
E. I don't know

36. Which of the following does <u>NOT</u> have to work with tools?

A. Barber
B. Mechanic
C. Carpenter
D. Milkman
E. I don't know

37. Which of the following spends the MOST amount of time at a desk?

A. Policeman
B. Actress
C. Carpenter
D. Secretary
E. I don't know

38. Which of the following spends the LEAST amount of time outdoors?

A. Athlete
B. Teacher
C. Farmer
D. Mailman
E. I don't know

39. Which of the following works MOST with groups of people?

A. Teacher
B. Mailman
C. Secretary
D. Chemist
E. I don't know

40. In which one of the following occupations do people work outdoors most frequently?

A. Dressmaker
B. Cashier
C. Ski Instructor
D. Cook
E. Window Decorator

41. In which one of the following occupations do people work under the most dangerous conditions?

A. Gardener
B. Librarian
C. Messenger Boy
D. Policeman
E. Butcher

42. Which one of the following works at home most frequently?

A. Author
B. Industrial Engineer
C. Surveyor
D. Poll Interviewer
E. Longshoreman

43. In which one of the following occupations do people usually make the MOST money?

A. Lawyer
B. Librarian
C. Automobile Mechanic
D. Bank Teller
E. Peddler

44. Which one of the following requires the LEAST knowledge of mathematics?

A. Teacher
B. Pilot
C. Mailman
D. Store Clerk
E. I don't know

45. Which of the following has to know the MOST about grammar?

A. Surveyor
B. Mechanic
C. Secretary
D. Engineer
E. I don't know

46. Which of the following does the LEAST amount of walking?

A. Milkman
B. Craneman
C. Mailman
D. Policeman
E. I don't know

47. Which one of the following makes the MOST money?

A. Hotel Front Office Clerk
B. Hotel Bell Boy
C. Hotel Manager
D. Cook
E. Maid

48. Which people are away from home most frequently?

A. Farmers
B. Teachers
C. Commercial Pilots
D. Policemen
E. Accountants

49. In which one of the following occupations do people usually make the MOST money?

A. Law Clerk
B. Psychotherapist
C. Cashier
D. Social Worker
E. Night Watchman

50. In which one of the following occupations do people usually make the MOST money?

A. Farmer
B. Dentist
C. Mail Carrier
D. Salesman
E. Nurse

51. In which one of the following occupations do people usually make the MOST money?

A. Tool Maker
B. Fisherman
C. Personnel Worker
D. Chemical Engineer
E. Auto Mechanic

52. Which one of the following works late at night most frequently?

A. Bank Clerk
B. School Teacher
C. Barber
D. Newspaper Reporter
E. Auto Mechanic

53. In which one of the following occupations do people usually make the MOST money?

A. Architect
B. Teacher
C. Forester
D. Toolmaker
E. Brickmason

54. In which one of the following occupations do people usually make the MOST money?

A. Fireman
B. Chemist
C. Typist
D. Nurse
E. Butcher

55. In which one of the following occupations do people usually make the MOST money?

A. Optometrist
B. Office Equipment Serviceman
C. Gardener
D. Construction Worker
E. Mail Carrier

56. Which one of the following occupations requires the LEAST education?

A. Typist
B. Instrument Maker
C. Wrapper
D. Advertising Copywriter
E. I don't know

57. Which one of the following occupations requires the LEAST training?

A. Athlete
B. Policeman
C. Mechanic
D. Milkman
E. I don't know

58. Which one of the following occupations requires the MOST education?

A. Barber
B. Mechanic
C. Laboratory Technician
D. Secretary
E. I don't know

59. Which one of the following occupations does NOT require special schooling?

A. Cab Driver
B. Nurse
C. Computer Programmer
D. Barber
E. I don't know

60. Which one of the following occupations requires special training?

A. Gardener
B. Electrician
C. Messenger Boy
D. Construction Laborer
E. I don't know

61. A college education is NOT required to be a:

A. Chemist
B. Doctor
C. Architect
D. Carpenter
E. I don't know

62. A college education is usually needed to be a:

A. Receptionist
B. Geologist
C. Actress
D. Copywriter
E. I don't know

63. Which one of the following occupations requires the LEAST training?

A. Hair Stylist
B. Mailman
C. Secretary
D. Pilot
E. I don't know

64. Which one of the following occupations usually requires the MOST education?

A. Chemical Engineer
B. Teacher
C. Surveyor
D. Surgebn
E. I don't know

65. Which one of the following occupations does NOT require special schooling?

A. Cashier
B. Nurse
C. Barber
D. Stewardess
E. I don't know

66. Which one of the following occupations requires a college degree?

A. Oil Well Driller
B. Window Decorator
C. Policeman
D. Landscape Architect
E. I don't know

67. Marine biologists usually have at least:

A. a college degree.
B. a high school diploma.
C. two years of high school.
D. a grade school education.
E. I don't know

68. Which one of the following requires the LEAST training?

A. Secretary
B. Carpenter
C. Mailman
D. Hair Stylist
E. I don't know

69. Which one of the following occupations requires the MOST training?

A. Sales Clerk
B. Baker
C. Machinist
D. Telephone Operator
E. I don't know

70. Which one of the following occupations requires the LEAST education?

A. Elevator Repairman
B. TV Repairman
C. Longshoreman
D. Bookkeeper
E. I don't know

71. Which one of the following occupations does NOT require a college education?

A. Choreographer
B. Physicist
C. Mathematician
D. Psychiatrist
E. I don't know

72. A college education is NOT required to be a:

A. Chemist
B. Architect
C. Mechanic
D. Agronomist
E. I don't know

73. Which one of the following occupations is learned through on-the-job training?

A. Civil Engineer
B. Printing Press Operator
C. Architect
D. Pharmacist
E. I don't know

74. Which one of the following occupations requires the LEAST education?

A. Licensed Practical Nurse
B. Registered Nurse
C. Electrical Engineer
D. Dentist
E. I don't know

75. Which one of the following occupations requires the LEAST training?

A. Astronaut
B. Telephone Operator
C. Doctor
D. Hair Stylist
E. I don't know

76. Experience as a kitchen helper is most useful for which one of the following occupations?

A. Restaurant Cook
B. Instrument Maker
C. Gardener
D. Nurse
E. I don't know

77. Interest in helping others <u>is</u> essential for which one of the following occupations?

A. TV Repairman
B. Nurse
C. Farmer
D. Stenographer
E. I don't know

78. Mechanical ability is most important in which one of the following occupations?

A. Typist
B. Paper Hanger
C. Electrician
D. Hairdresser
E. I don't know

79. Good taste in colors <u>is</u> essential for which one of the following occupations?

A. Sociologist
B. Surgeon
C. Interior Decorator
D. High School Teacher
E. I don't know

80. The skill of sewing is most useful for which one of the following occupations?

A. Nurse
B. Seamstress
C. Surgeon
D. Interior Decorator
E. I don't know

81. Interest in reading and studying is most helpful in which one of the following occupations?

A. Historian
B. Dressmaker
C. Legal Clerk
D. Typesetter
E. I don't know

82. Interest in sports is essential for which one of the following occupations?

A. Anthropologist
B. Forester
C. Fisherman
D. Athletic Director
E. I don't know

83. The ability to speak and debate is essential in which one of the following occupations?

A. Concert Singer
B. Policeman
C. Cab Driver
D. Lawyer
E. I don't know

84. Imagination is most important in which one of the following occupations?

A. Advertising Artist
B. Electrician
C. Social Worker
D. Librarian
E. I don't know

85. A person who has a fear of heights would NOT likely enter which one of the following occupations?

A. Telephone Lineman
B. Dressmaker
C. Window Decorator
D. Carpenter
E. I don't know

86. The ability to express oneself in writing is essential in which one of the following occupations?

A. Civil Engineer
B. Actor
C. Secretary
D. Author
E. I don't know

87. A hobby of rock collecting and cave exploration is most useful for which one of the following occupations?

A. Biologist
B. Oil Well Driller
C. Geologist
D. Bricklayer
E. I don't know

88. Experience in 4-H clubs is most helpful for which one of the following occupations?

A. Lumberjack
B. Fisherman
C. Sales Clerk
D. Farmer
E. I don't know

89. Success in English composition is essential for which one of the following occupations?

A. Journalist
B. Playground Director
C. Aircraft Mechanic
D. Physical Therapist
E. I don't know

90. Physical strength <u>is</u> essential for which one of the following occupations?

A. Lumberjack
B. Heavy Equipment Operator
C. Messenger Boy
D. Butcher
E. I don't know

91. Creativity <u>is</u> essential for which one of the following occupations?

A. Architect
B. Home Economist
C. Accountant
D. Statistician
E. I don't know

92. Experience as a paratrooper is most useful for which one of the following occupations?

A. Air Freight Delivery
B. Forest Fire Fighter
C. Truck Driver
D. Lumberjack
E. I don't know

93. The ability to work irregular hours is <u>NOT</u> important for which one of the following occupations?

A. Sales Clerk
B. Newspaper Reporter
C. Electrical Engineer
D. Mail Carrier
E. I don't know

94. Interest in human interaction <u>is</u> essential for which one of the following occupations?

A. Mechanical Engineer
B. Psychotherapist
C. Computer Programmer
D. Concert Singer
E. I don't know

95. Experience in preparing meals is most useful for which one of the following occupations?

A. Waiter
B. Dishwasher
C. Dietitian
D. Bartender
E. I don't know

96. What kind of work is usually done by a VETERINARIAN?

A. Sells feed and grain
B. Repairs farm machinery
C. Works with retired soldiers
D. Takes care of animals
E. I don't know

97. A CARPENTER:

A. finishes concrete surfaces.
B. constructs walls and chimneys from brick.
C. erects the wood framework in buildings.
D. covers pipes and boilers with insulation.
E. I don't know

98. Which one of the following would most likely assist people in making arrangements for an out-of-town trip?

A. Airline Stewardess
B. Travel Agent
C. Porter
D. Usher
E. I don't know

99. Which one of the following designs buildings?

A. Mechanic
B. Architect
C. Surveyor
D. Engineer
E. I don't know

100. Which one of the following would engineer the structure of a space craft?

A. Aeronautical Engineer
B. Electrical Engineer
C. Electronic Engineer
D. Mechanical Engineer
E. I don't know

101. Which one of the following would select paintings to fit the decor of a home?

A. Arranger
B. Choreographer
C. Interior Designer
D. Fashion Designer
E. I don't know

102. Which one of the following seats people at a theater or auditorium?

A. Usher
B. Waiter
C. Porter
D. Stewardess
E. I don't know

103. An INSURANCE AGENT:

A. sells policies which protect against future losses.
B. makes property transactions.
C. secures loans for repair of damaged property.
D. reviews insurance applications to evaluate the degree of risk involved.
E. I don't know

104. An ASTRONOMER:

A. studies the celestial bodies of the universe.
B. analyzes the forms of energy and matter.
C. predicts the future from the stars.
D. makes rings, pins, and other jewelry by hand.
E. I don't know

105. Which one of the following fills prescriptions for drugs and medicines?

A. Chemist
B. Physicist
C. Pharmacist
D. Pharmacologist
E. I don't know

106. Which one of the following is usually responsible for classifying and storing business documents?

A. Office Boy
B. File Clerk
C. Secretary
D. Typist
E. I don't know

107. Which one of the following makes metal printing plates?

A. Engraver
B. Assembler
C. Electronic Technician
D. Engineering Technician
E. I don't know

108. What kind of work does a SURVEYOR most likely do?

A. Sells stocks and bonds
B. Oversees workers in a factory
C. Determines property boundaries
D. Designs roads and highways
E. I don't know

109. A LANDSCAPE ARCHITECT:

A. raises and sells plants and shrubs.
B. plans and designs the exterior of a building.
C. draws city zoning maps.
D. plans and designs the arrangement of outdoor areas.
E. I don't know

110. What kind of work do you think a DIETITIAN most likely does?

A. Sterilizes instruments in a dental clinic
B. Supervises exercise and weight control at health clubs
C. Sells books on how to reduce
D. Plans menus and supervises preparation of meals
E. I don't know

111. Which one of the following advises people about legal claims or rights?

A. Judge
B. Accountant
C. Lawyer
D. Lecturer
E. I don't know

112. What kind of work is usually done by an ACCOUNTANT?

A. Collects money for bills
B. Sells stocks and bonds
C. Keeps business records
D. Writes descriptions of accidents
E. I don't know

113. A CERTIFIED PUBLIC ACCOUNTANT:

A. makes decisions about the marketing of goods.
B. locates and hires employees.
C. shapes and maintains the public image of a business.
D. compiles and analyzes business records.
E. I don't know

114. A PHARMACIST:

A. helps persons with muscle, nerve, and bone diseases to overcome their disabilities.
B. diagnoses patients' illnesses and prescribes medicines.
C. dispenses drugs and medicines and provides information about their use.
D. examines the processes through which food is utilized.
E. I don't know

115. An AVIATOR:

A. repairs mechanical and electrical equipment on an airplane.
B. monitors the operation of mechanical and electrical equipment on an airplane.
C. schedules flights for passengers.
D. designs and builds airplanes.
E. I don't know

116. What does a NURSERYMAN do?

A. Grows tobacco
B. Grows vegetables
C. Manages a kindergarten
D. Grows flowers
E. I don't know

117. An OPTOMETRIST:

A. diagnoses and treats diseases of the mind.
B. helps people improve their vision.
C. provides information on use of drugs.
D. diagnoses and treats bone diseases.
E. I don't know

118. Which one of the following carries luggage in a hotel?

A. Usher
B. Waiter
C. Caretaker
D. Porter
E. I don't know

119. Which one of the following handles payments and withdrawals in a bank?

A. Teller
B. Cashier
C. Bookkeeper
D. Currency Sorter
E. I don't know

120. A DATA-PROCESSING EQUIPMENT SERVICEMAN:

A. repairs and maintains traffic counters.
B. repairs and services dictating machines.
C. maintains and repairs duplicating machines.
D. installs and maintains computers.
E. I don't know

APPENDIX C

SUMMARY STATISTICS FOR COGNITIVE VOCATIONAL MATURITY TEST

Grade 6

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Test	Name	Items	Number of Items	Grade	N	Mean	S.D.	KR-20	Standard Error of Measurement	Range
1	Fields of Work	1-20	20	6	1398	11.67	4.60	.83	1.87	1-20
2	Job Selection	21-35	15	6	1398	6.38	3.02	.67	1.75	1-15
3	Work Conditions	36-55	20	6	1398	12.58	4.78	.85	1.85	1-20
4	Education Required	56-75	20	6	1398	9.90	4.41	.80	1.97	1-20
5	Attributes Required	76-95	20	6	1398	10.21	5.32	.87	1.89	1-20
6	Duties	96-120	25	6	1398	11.50	6.19	.88	2.14	1-25

Grade 7

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Test	Name	Items	Number of Items	Grade	N	Mean	S.D.	KR-20	Standard Error of Measurement	Range
1	Fields of Work	1-20	20	9	2384	12.92	4.48	.84	1.80	1-20
2	Job Selection	21-35	15	9	2384	7.29	3.14	.69	1.74	1-15
3	Work Conditions	36-55	20	9	2384	13.79	4.58	.85	1.77	1-20
4	Education Required	56-75	20	9	2384	11.37	4.47	.82	1.92	1-20
5	Attributes Required	76-95	20	9	2384	11.91	5.30	.88	1.81	1-20
6	Duties	96-120	25	9	2384	13.46	6.52	.90	2.10	1-25

Grade 8

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Test	Name	Items	Number of Items	Grade	N	Mean	S.D.	KR-20	Standard Error of Measurement	Range
1	Fields of Work	1-20	20	8	2659	14.47	4.15	.83	1.69	1-20
2	Job Selection	21-35	15	8	2659	8.53	3.18	.71	1.71	1-15
3	Work Conditions	36-55	20	8	2659	15.27	4.33	.86	1.61	1-20
4	Education Required	56-75	20	8	2659	13.05	4.45	.83	1.83	1-20
5	Attributes Required	76-95	20	8	2659	13.77	5.12	.89	1.67	1-20
6	Duties	96-120	25	8	2659	15.78	6.63	.91	1.98	1-25

Grade 9

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Test	Name	Items	Number of Items	Grade	N	Mean	S.D.	KR-20	Standard Error of Measurement	Range
1	Fields of Work	1-20	20	9	926	15.88	3.40	.79	1.58	2-20
2	Job Selection	21-35	15	9	926	9.73	2.87	.67	1.65	1-15
3	Work Conditions	36-55	20	9	926	16.90	3.30	.81	1.44	1-20
4	Education Required	56-75	20	9	926	14.91	3.62	.78	1.71	1-20
5	Attributes Required	76-95	20	9	926	15.55	4.15	.86	1.53	1-20
6	Duties	96-120	25	9	926	18.40	5.52	.89	1.86	3-25

APPENDIX D

ITEM STATISTICS FOR COGNITIVE VOCATIONAL

MATURITY TEST FINAL FORM

GRADE 6

Cognitive Vocational Maturity Test

Area Subtest 1: Fields of Work
Grade 6 (N=1398)

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Item Number	Correct Response	Difficulty Index	Point Biserial	Number Choosing Each Response				
				1	2	3	4	5
1	3	.79	.49	82	72	1109	81	52
2	1	.75	.51	1053	178	70	71	25
3	4	.72	.59	121	98	105	1008	63
4	2	.77	.55	119	1074	77	89	37
5	1	.67	.49	931	263	69	94	39
6	3	.76	.46	155	68	1054	47	71
7	1	.71	.54	986	233	76	71	27
8	2	.68	.56	82	943	133	126	102
9	4	.68	.55	53	221	130	954	36
10	4	.57	.43	142	168	235	794	52
11	1	.63	.52	875	81	132	129	174
12	4	.59	.55	254	151	95	824	65
13	2	.56	.53	62	784	463	52	34
14	4	.54	.49	262	181	128	746	73
15	1	.36	.47	498	302	174	266	151
16	2	.47	.44	193	656	159	250	129
17	1	.36	.44	505	201	278	335	72
18	2	.48	.53	83	664	404	164	78
19	1	.33	.38	459	128	183	438	180
20	3	.29	.32	276	372	402	295	36

Cognitive Vocational Maturity Test

Area Subtest 2: Career Selection
Grade 6 (N=1398)

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Item Number	Correct Response	Difficulty Index	Point Biserial	Number Choosing Each Response				
				1	2	3	4	5
21	1	.62	.44	867	104	276	94	53
22	4	.56	.44	209	151	203	787	45
23	3	.49	.41	296	152	678	184	83
24	2	.54	.43	340	758	159	96	41
25	3	.48	.46	380	134	676	145	61
26	2	.52	.42	269	723	157	183	58
27	2	.52	.50	291	721	118	147	116
28	2	.45	.45	222	625	134	333	73
29	2	.37	.50	180	515	413	201	84
30	3	.43	.38	273	262	600	136	122
31	2	.27	.45	138	375	226	567	87
32	3	.34	.46	471	406	88	376	48
33	3	.29	.32	518	297	404	93	83
34	3	.25	.33	340	210	355	390	99
35	3	.26	.30	425	212	362	329	62

Cognitive Vocational Maturity Test

Area Subtest 3: Work Conditions
Grade 6 (N=1398)

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Item Number	Correct Response	Difficulty Index	Point Biserial	Number Choosing Each Response				
				1	2	3	4	5
36	4	.83	.53	63	73	69	1154	28
37	4	.85	.57	62	59	66	1179	27
38	2	.74	.59	106	1032	145	83	25
39	1	.81	.52	1126	71	76	91	26
40	3	.73	.51	61	71	1013	71	172
41	4	.74	.54	56	81	65	1029	165
42	1	.59	.56	817	100	157	152	163
43	1	.68	.55	947	43	142	214	42
44	3	.58	.53	135	268	803	138	48
45	3	.65	.53	151	116	903	133	92
46	2	.64	.53	98	886	160	196	50
47	3	.63	.51	243	70	877	117	75
48	3	.49	.39	123	119	678	401	64
49	2	.49	.44	354	684	130	103	119
50	2	.59	.50	67	823	109	163	233
51	4	.56	.49	88	78	227	772	222
52	4	.54	.41	183	117	115	748	223
53	1	.55	.50	768	236	85	83	218
54	2	.50	.47	148	698	147	338	59
55	1	.46	.55	644	269	117	298	60

Cognitive Vocational Maturity Test

Area Subtest 4: Education Required
Grade 6 (N=1398)

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Item Number	Correct Response	Difficulty Index	Point Biserial	Number Choosing Each Response				
				1	2	3	4	5
56	3	.72	.61	86	105	1003	119	72
57	4	.69	.56	175	111	108	958	39
58	3	.64	.52	92	107	892	260	41
59	1	.66	.57	909	106	145	176	46
60	2	.63	.51	84	873	116	258	56
61	4	.61	.57	139	132	184	854	84
62	2	.51	.46	204	714	193	173	106
63	2	.62	.56	242	866	137	97	44
64	4	.44	.49	277	331	114	606	60
65	1	.44	.47	606	109	310	302	55
66	4	.49	.47	109	113	418	676	69
67	1	.39	.38	538	428	187	135	94
68	3	.56	.47	113	245	775	200	48
69	3	.39	.39	149	137	534	517	47
70	3	.38	.30	117	148	525	519	78
71	1	.42	.41	581	183	237	139	242
72	3	.39	.37	116	219	537	324	170
73	2	.40	.37	311	557	172	194	154
74	1	.30	.33	409	271	349	251	106
75	2	.31	.30	134	425	143	640	47

Cognitive Vocational Maturity Test

Area Subtest 5: Attributes Required
Grade 6 (N=1398)

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Item Number	Correct Response	Difficulty Index	Point Biserial	Number Choosing Each Response				
				1	2	3	4	5
76	1	.70	.61	970	129	133	103	46
77	2	.58	.55	167	798	188	148	83
78	3	.63	.60	116	175	867	142	80
79	3	.63	.67	100	162	868	173	82
80	2	.65	.60	128	893	142	161	54
81	1	.57	.59	795	134	210	174	76
82	4	.57	.64	98	142	301	780	59
83	4	.53	.54	266	160	163	734	60
84	1	.53	.67	736	178	213	159	90
85	1	.56	.58	774	164	271	136	41
86	4	.51	.60	120	231	284	707	45
87	3	.45	.51	321	185	621	180	73
88	4	.46	.47	140	161	328	636	119
89	1	.52	.63	727	148	168	211	137
90	1	.42	.49	589	445	170	119	62
91	1	.39	.49	532	358	188	191	110
92	2	.41	.34	438	560	157	115	103
93	2	.28	.18	282	391	240	383	89
94	2	.50	.56	114	684	244	193	144
95	3	.45	.49	369	152	615	180	64

Cognitive Vocational Maturity Test

Area Subtest 6: Duties
Grade 6 (N=1398)

BEST COPY AVAILABLE

Item Number	Correct Response	Difficulty Index	Point Biserial	Number Choosing Each Response				
				1	2	3	4	5
96	4	.66	.62	112	139	149	909	62
97	3	.61	.53	146	214	843	122	64
98	2	.57	.58	248	789	166	125	62
99	2	.59	.60	103	816	219	167	79
100	1	.59	.54	813	147	175	172	80
101	3	.56	.57	206	121	772	227	64
102	1	.56	.62	779	156	245	137	63
103	1	.50	.54	686	138	240	223	93
104	1	.43	.57	586	229	330	101	132
105	3	.58	.58	154	196	810	159	66
106	2	.53	.54	146	739	301	145	57
107	1	.52	.62	729	214	195	131	121
108	3	.45	.49	156	205	627	300	92
109	4	.43	.51	168	246	270	601	101
110	4	.40	.49	134	368	212	560	112
111	3	.40	.43	403	201	561	171	50
112	3	.39	.40	397	223	533	137	92
113	4	.34	.43	189	231	305	472	189
114	3	.48	.48	147	318	650	138	110
115	2	.32	.33	174	441	323	260	166
116	4	.41	.54	116	240	364	554	92
117	2	.36	.39	201	501	237	260	175
118	4	.38	.52	258	237	294	526	60
119	1	.29	.35	398	472	279	168	67
120	4	.28	.38	159	275	328	386	217

APPENDIX E

ITEM STATISTICS FOR COGNITIVE VOCATIONAL

MATURITY TEST FINAL FORM

GRADE 7

Cognitive Vocational Maturity Test

Area Subtest 1: Fields of Work
Grade 7 (N=2384)

BEST COPY AVAILABLE

Item Number	Correct Response	Difficulty Index	Point Biserial	Number Choosing Each Response				
				1	2	3	4	5
1	3	.87	.44	66	95	2063	103	53
2	1	.81	.51	1939	201	85	120	38
3	4	.80	.57	156	100	159	1903	61
4	2	.80	.51	198	1912	79	132	60
5	1	.71	.47	1687	380	93	154	66
6	3	.80	.48	276	70	1902	51	81
7	1	.74	.52	1771	397	80	73	58
8	2	.77	.56	111	1836	183	136	109
9	4	.75	.54	78	280	186	1791	44
10	4	.64	.48	215	255	326	1527	52
11	1	.70	.49	1673	121	153	149	282
12	4	.65	.57	418	199	123	1551	79
13	2	.67	.54	48	1589	604	84	55
14	4	.58	.47	445	290	171	1378	95
15	1	.41	.50	962	415	300	454	244
16	2	.55	.49	275	1295	182	408	210
17	1	.44	.47	1038	310	421	502	103
18	2	.52	.54	108	1225	667	222	152
19	1	.44	.46	1038	166	258	666	250
20	3	.31	.34	446	665	733	473	55

Cognitive Vocational Maturity Test

Area Subtest 2: Career Selection
Grade 7 (N=2384)

BEST COPY AVAILABLE

Item Number	Correct Response	Difficulty Index	Point Biserial	Number Choosing Each Response				
				1	2	3	4	5
21	1	.69	.50	1653	151	364	120	92
22	4	.63	.43	302	249	269	1510	49
23	3	.58	.42	391	277	1383	227	101
24	2	.60	.42	620	1432	159	112	52
25	3	.53	.49	591	208	1259	226	94
26	2	.59	.39	497	1397	171	244	65
27	2	.59	.51	432	1392	186	213	156
28	2	.52	.48	387	1235	201	444	103
29	2	.46	.54	318	1095	559	278	123
30	3	.48	.42	336	518	1152	181	189
31	2	.36	.45	223	855	322	825	152
32	3	.41	.48	977	635	133	572	57
33	3	.34	.34	910	435	802	121	110
34	3	.26	.33	563	345	619	724	126
35	3	.26	.28	829	281	618	584	66

Cognitive Vocational Maturity Test

Area Subtest 3: Work Conditions
Grade 7 (N=2384)

BEST COPY AVAILABLE

Item Number	Correct Response	Difficulty Index	Point Biserial	Number Choosing Each Response				
				1	2	3	4	5
36	4	.88	.52	86	86	83	2083	37
37	4	.89	.55	90	88	69	2115	17
38	2	.80	.58	141	1905	198	105	29
39	1	.84	.48	1988	99	90	167	34
40	3	.79	.52	75	73	1883	85	260
41	4	.79	.47	73	53	75	1887	290
42	1	.70	.57	1653	121	192	166	241
43	1	.74	.54	1757	67	253	273	31
44	3	.66	.56	146	390	1574	204	63
45	3	.73	.56	182	152	1746	174	122
46	2	.69	.51	135	1633	227	305	70
47	3	.71	.49	358	92	1686	165	72
48	3	.57	.45	148	164	1344	619	97
49	2	.55	.45	572	1298	171	153	180
50	2	.65	.51	109	1553	124	228	362
51	4	.58	.51	129	95	326	1371	452
52	4	.60	.42	236	157	141	1425	403
53	1	.60	.54	1410	284	116	86	473
54	2	.53	.49	245	1253	190	581	99
55	1	.55	.56	1301	380	126	485	81

Cognitive Vocational Maturity Test

Area Subtest 4: Education Required
Grade 7 (N=2384)

BEST COPY AVAILABLE

Item Number	Correct Response	Difficulty Index	Point Biserial	Number Choosing Each Response				
				1	2	3	4	5
56	3	.80	.55	114	127	1900	151	78
57	4	.77	.55	237	151	123	1817	41
58	3	.70	.53	90	150	1668	416	51
59	1	.76	.57	1799	118	177	228	48
60	2	.72	.51	102	1716	150	329	74
61	4	.70	.58	153	161	236	1656	166
62	2	.60	.51	305	1426	273	244	124
63	2	.70	.54	371	1650	165	136	49
64	4	.51	.54	436	519	131	1214	61
65	1	.52	.51	1224	143	434	498	66
66	4	.57	.49	155	149	597	1360	105
67	1	.48	.44	1142	656	254	188	130
68	3	.59	.45	139	434	1404	315	68
69	3	.44	.39	208	174	1044	885	57
70	3	.42	.35	188	209	1003	824	148
71	1	.51	.47	1209	291	261	184	427
72	3	.47	.38	154	275	1105	551	270
73	2	.48	.41	523	1147	244	247	206
74	1	.32	.29	765	563	530	301	215
75	2	.36	.38	169	849	158	1123	67

Cognitive Vocational Maturity Test

Area Subtest 5: Attributes Required
Grade 7 (N=2384)

BEST COPY AVAILABLE

Item Number	Correct Response	Difficulty Index	Point Biserial	Number Choosing Each Response				
				1	2	3	4	5
76	1	.80	.58	1892	155	141	110	66
77	2	.68	.58	236	1609	231	191	105
78	3	.73	.59	153	222	1732	148	115
79	3	.72	.67	153	201	1714	193	109
80	2	.74	.63	135	1740	197	229	66
81	1	.67	.58	1589	216	272	201	82
82	4	.68	.65	139	177	373	1601	81
83	4	.64	.62	357	212	179	1518	95
84	1	.65	.69	1524	224	286	210	109
85	1	.65	.58	1545	193	365	204	59
86	4	.61	.63	137	307	400	1451	75
87	3	.54	.56	459	271	1280	233	119
88	4	.46	.49	206	246	568	1096	244
89	1	.63	.64	1488	222	197	268	192
90	1	.51	52	1211	719	196	153	89
91	1	.49	.53	1166	566	221	233	178
92	2	.43	.39	790	1017	240	152	156
93	2	.29	.16	553	685	360	655	110
94	2	.56	.52	172	1331	376	276	205
95	3	.51	.51	595	218	1212	250	88

Cognitive Vocational Maturity Test

Area Subtest 6: Duties
Grade 7: (N=2384)

BEST COPY AVAILABLE

Item Number	Correct Response	Difficulty Index	Point Biserial	Number Choosing Each Response				
				1	2	3	4	5
96	4	.75	.58	133	184	213	1755	65
97	3	.68	.55	187	308	1598	185	87
98	2	.67	.57	350	1577	218	155	64
99	2	.68	.58	143	1618	297	240	67
100	1	.65	.61	1532	198	276	212	145
101	3	.64	.59	267	196	1509	314	77
102	1	.66	.57	1548	227	343	162	81
103	1	.60	.54	1418	195	349	303	101
104	1	.49	.56	1165	294	541	148	213
105	3	.62	.64	221	326	1464	227	121
106	2	.62	.55	185	1471	474	155	76
107	1	.62	.60	1455	297	242	194	176
108	3	.53	.52	175	285	1253	487	152
109	4	.48	.50	209	478	406	1135	133
110	4	.49	.54	181	552	306	1154	169
111	3	.51	.47	560	277	1205	239	75
112	3	.44	.47	668	350	1030	154	157
113	4	.41	.51	267	336	452	966	333
114	3	.54	.53	196	516	1260	183	193
115	2	.45	.42	303	1059	467	350	177
116	4	.47	.55	141	335	609	1108	157
117	2	.44	.46	288	1027	325	365	348
118	4	.45	.57	348	347	500	1056	115
119	1	.37	.43	885	716	412	247	110
120	4	.36	.49	211	468	483	841	355

APPENDIX F

ITEM STATISTICS FOR COGNITIVE VOCATIONAL

MATURITY TEST, FINAL FORM

GRADE 8

Cognitive Vocational Maturity Test

Area Subtest 1: Fields of Work
Grade 8 (N=2659)

BEST COPY AVAILABLE

Item Number	Correct Response	Difficulty Index	Point Biserial	Number Choosing Each Response				
				1	2	3	4	5
1	3	.91	.41	37	61	2422	95	35
2	1	.86	.45	2271	210	44	108	21
3	4	.88	.52	99	64	113	2345	35
4	2	.86	.50	138	2285	73	122	41
5	1	.78	.51	2077	339	84	108	44
6	3	.85	.48	219	44	2268	43	81
7	1	.82	.51	2183	291	73	64	44
8	2	.83	.59	99	2206	149	111	91
9	4	.82	.52	47	232	169	2169	36
10	4	.70	.47	187	248	306	1859	47
11	1	.79	.48	2104	94	130	107	219
12	4	.75	.54	363	132	94	2003	62
13	2	.76	.57	35	2025	469	57	67
14	4	.67	.47	449	253	115	1772	67
15	1	.53	.52	1416	371	235	429	199
16	2	.63	.49	281	1656	137	400	174
17	1	.52	.48	1379	300	394	488	93
18	2	.62	.53	95	1649	638	174	100
19	1	.53	.50	1405	178	183	673	214
20	3	.37	.36	490	596	976	541	43

Cognitive Vocational Maturity Test

Area Subtest 2: Career Selection
Grade 8 (N=2659)

BEST COPY AVAILABLE

Item Number	Correct Response	Difficulty Index	Point Biserial	Number Choosing Each Response				
				1	2	3	4	5
21	1	.78	.43	2056	112	308	100	72
22	4	.68	.40	219	267	313	1807	48
23	3	.67	.44	334	251	1789	208	76
24	2	.69	.45	528	1827	178	83	38
25	3	.65	.50	483	152	1717	216	85
26	2	.69	.40	428	1819	120	232	55
27	2	.68	.52	381	1812	158	154	152
28	2	.61	.50	413	1617	144	393	78
29	2	.58	.56	304	1550	470	220	107
30	3	.55	.40	299	570	1448	147	186
31	2	.45	.46	203	1180	329	812	122
32	3	.50	.51	1333	508	101	659	47
33	3	.36	.36	1002	475	957	124	92
34	3	.35	.42	485	329	937	758	138
35	3	.31	.34	945	268	825	548	60

Cognitive Vocational Maturity Test

Area Subtest 3: Work Conditions
Grade 8 (N=2659)

BEST COPY AVAILABLE

Item Number	Correct Response	Difficulty Index	Point Biserial	Number Choosing Each Response				
				1	2	3	4	5
36	4	.92	.48	68	60	66	2423	28
37	4	.92	.51	65	63	56	2451	16
38	2	.87	.54	90	2312	153	84	18
39	1	.89	.50	2350	73	92	123	16
40	3	.84	.54	61	55	2219	59	253
41	4	.84	.48	61	52	50	2221	265
42	1	.77	.58	2036	108	153	153	195
43	1	.82	.54	2166	46	199	206	36
44	3	.75	.56	103	327	1991	170	56
45	3	.82	.53	155	130	2168	119	82
46	2	.73	.53	134	1937	223	289	71
47	3	.78	.51	316	72	2080	146	41
48	3	.64	.49	135	119	1694	618	84
49	2	.67	.53	508	1782	126	116	112
50	2	.76	.53	107	2005	94	169	268
51	4	.65	.53	116	79	311	1724	422
52	4	.69	.41	185	150	130	1823	357
53	1	.67	.57	1768	240	101	76	456
54	2	.64	.52	164	1689	207	527	62
55	1	.67	.59	1776	264	97	462	55

Cognitive Vocational Maturity Test

Area Subtest 4: Education Required
Grade 8 (N=2659)

BEST COPY AVAILABLE

Item Number	Correct Response	Difficulty Index	Point Biserial	Number Choosing Each Response				
				1	2	3	4	5
56	3	.87	.55	88	105	2292	104	58
57	4	.82	.51	226	98	117	2176	30
58	3	.77	.53	98	136	2027	351	34
59	1	.83	.57	2210	92	123	172	53
60	2	.80	.48	96	2111	115	285	46
61	4	.79	.57	108	138	165	2103	135
62	2	.68	.49	256	1809	225	250	110
63	2	.78	.57	304	2064	139	110	37
64	4	.62	.57	381	447	131	1651	37
65	1	.63	.55	1670	113	393	410	57
66	4	.67	.48	124	134	499	1782	107
67	1	.57	.49	1509	662	198	139	141
68	3	.67	.43	119	435	1773	266	51
69	3	.50	.44	182	176	1324	897	68
70	3	.53	.40	192	220	1404	702	128
71	1	.63	.51	1669	215	229	152	386
72	3	.56	.45	129	253	1473	539	245
73	2	.56	.48	549	1483	235	223	156
74	1	.38	.35	1012	549	624	273	189
75	2	.44	.44	146	1159	122	1149	72

Cognitive Vocational Maturity Test

Area Subtest 5: Attributes Required
Grade 8 (N=2659)

BEST COPY AVAILABLE

Item Number	Correct Response	Difficulty Index	Point Biserial	Number Choosing Each Response				
				1	2	3	4	5
76	1	.85	.64	2241	152	107	99	44
77	2	.77	.59	210	2033	185	157	60
78	3	.80	.55	144	163	2120	125	91
79	3	.82	.68	130	172	2161	121	63
80	2	.81	.64	112	2133	171	175	51
81	1	.75	.57	1974	135	300	163	68
82	4	.78	.62	103	138	299	2061	41
83	4	.75	.63	306	161	136	1984	56
84	1	.74	.68	1957	188	242	144	101
85	1	.71	.60	1876	186	366	162	45
86	4	.72	.65	118	252	329	1893	45
87	3	.69	.61	365	191	1816	204	75
88	4	.63	.57	147	191	468	1652	184
89	1	.75	.67	1979	138	152	233	131
90	1	.58	.55	1531	759	160	126	69
91	1	.58	.59	1531	518	224	215	148
92	2	.52	.39	837	1361	192	107	131
93	2	.32	.11	620	839	377	713	89
94	2	.66	.58	112	1744	319	272	194
95	3	.65	.59	504	169	1722	187	66

Cognitive Vocational Maturity Test

Area Subtest 6: Duties
Grade 8 (N=2659)

BEST COPY AVAILABLE

Item Number	Correct Response	Difficulty Index	Point Biserial	Number Choosing Each Response				
				1	2	3	4	5
96	4	.80	.62	120	157	187	2121	53
97	3	.75	.55	169	296	1961	151	54
98	2	.76	.59	295	2002	153	134	48
99	2	.76	.61	133	2001	235	214	59
100	1	.74	.64	1953	178	244	184	101
101	3	.74	.59	200	152	1965	276	50
102	1	.72	.63	1893	231	329	147	45
103	1	.66	.52	1754	143	328	341	78
104	1	.66	.60	1742	247	406	116	128
105	3	.72	.63	176	280	1906	205	75
106	2	.71	.57	156	1864	423	130	68
107	1	.69	.61	1820	264	246	180	135
108	3	.60	.55	157	268	1568	544	94
109	4	.59	.54	156	421	395	1556	107
110	4	.63	.59	152	461	269	1656	106
111	3	.63	.53	465	229	1663	222	68
112	3	.54	.51	655	297	1417	154	120
113	4	.51	.55	246	271	433	1351	325
114	3	.65	.58	168	442	1704	176	141
115	2	.50	.48	259	1326	520	340	190
116	4	.57	.52	118	305	575	1491	143
117	2	.56	.51	246	1460	281	336	303
118	4	.55	.57	395	291	419	1458	83
119	1	.46	.46	1210	680	414	258	82
120	4	.43	.51	182	512	505	1129	297

APPENDIX G

ITEM STATISTICS FOR COGNITIVE VOCATIONAL

MATURITY TEST FINAL FORM

GRADE 9

Cognitive Vocational Maturity Test

Area Subtest 1: Fields of Work
Grade 9 (N=926)

BEST COPY AVAILABLE

Item Number	Correct Response	Difficulty Index	Point Biserial	Number Choosing Each Response				
				1	2	3	4	5
1	3	.96	.28	3	14	887	21	1
2	1	.89	.46	820	55	14	31	5
3	4	.91	.49	25	14	30	846	11
4	2	.93	.41	38	860	12	14	2
5	1	.83	.40	764	103	5	42	12
6	3	.90	.40	54	8	832	7	25
7	1	.86	.43	796	97	9	14	7
8	2	.91	.44	16	839	29	27	15
9	4	.89	.46	3	45	45	823	10
10	4	.78	.43	48	62	87	723	6
11	1	.83	.39	767	32	43	17	66
12	4	.84	.47	85	30	9	781	20
13	2	.85	.47	9	789	84	28	16
14	4	.77	.49	108	60	31	710	16
15	1	.61	.50	564	87	83	146	46
16	2	.70	.49	83	642	36	117	45
17	1	.62	.50	571	101	104	119	31
18	2	.73	.51	19	671	173	44	18
19	1	.64	.53	596	22	30	219	59
20	3	.46	.39	138	193	423	157	12

Cognitive Vocational Maturity Test

Area Subtest 2: Career Selection
Grade 9 (N=926)

BEST COPY AVAILABLE

Item Number	Correct Response	Difficulty Index	Point Biserial	Number Choosing Each Response				
				1	2	3	4	5
21	1	.87	.38	810	20	62	23	11
22	4	.71	.35	53	116	87	657	12
23	3	.77	.37	77	68	715	46	19
24	2	.76	.33	139	701	57	20	7
25	3	.75	.44	115	44	690	51	25
26	2	.70	.31	152	651	28	76	19
27	2	.77	.45	93	713	33	35	51
28	2	.71	.45	128	659	38	79	20
29	2	.73	.55	71	673	86	49	42
30	3	.59	.39	79	186	545	35	79
31	2	.53	.43	44	494	105	242	39
32	3	.63	.50	583	112	19	195	13
33	3	.38	.43	360	150	355	26	33
34	3	.43	.47	117	88	397	280	41
35	3	.39	.46	292	81	364	170	16

Cognitive Vocational Maturity Test

Area Subtest 3: Work Conditions
Grade 9 (N=926)

BEST COPY AVAILABLE

Item Number	Correct Response	Difficulty Index	Point Biserial	Number Choosing Each Response				
				1	2	3	4	5
36	4	.96	.35	9	8	10	891	8
37	4	.96	.46	15	8	11	889	3
38	2	.94	.42	8	873	18	22	5
39	1	.92	.38	855	22	13	30	6
40	3	.90	.44	8	22	830	8	58
41	4	.89	.40	9	6	9	826	76
42	1	.87	.52	805	18	23	46	34
43	1	.89	.50	825	12	53	30	6
44	3	.83	.45	20	72	766	54	13
45	3	.89	.51	27	35	826	21	16
46	2	.79	.55	46	735	21	106	18
47	3	.86	.52	72	9	798	37	8
48	3	.76	.42	43	31	706	133	11
49	2	.78	.46	150	719	16	21	19
50	2	.84	.54	15	778	23	44	65
51	4	.77	.49	20	6	55	715	130
52	4	.74	.42	52	48	19	684	120
53	1	.77	.51	709	46	17	11	142
54	2	.75	.51	43	693	44	133	12
55	1	.79	.53	729	40	28	119	10

Cognitive Vocational Maturity Test

Area Subtest 4: Education Required
Grade 9 (N=926)

BEST COPY AVAILABLE

Item Number	Correct Response	Difficulty Index	Point Biserial	Number Choosing Each Response				
				1	2	3	4	5
56	3	.91	.50	17	13	842	36	15
57	4	.87	.42	66	16	21	809	13
58	3	.87	.40	23	41	801	58	2
59	1	.92	.48	852	15	27	21	9
60	2	.87	.37	13	804	24	80	1
61	4	.90	.49	14	18	29	837	28
62	2	.78	.44	79	725	45	57	19
63	2	.84	.43	97	778	22	17	10
64	4	.75	.46	123	81	14	694	14
65	1	.77	.55	716	27	83	89	10
66	4	.82	.43	18	23	101	753	28
67	1	.67	.46	622	204	37	25	35
68	3	.72	.40	40	139	670	68	8
69	3	.60	.42	67	41	554	239	25
70	3	.59	.41	63	38	549	229	45
71	1	.67	.47	620	48	74	39	144
72	3	.68	.45	29	48	627	152	67
73	2	.73	.48	127	675	39	47	37
74	1	.45	.40	413	203	186	62	61
75	2	.51	.41	27	467	24	397	9

Cognitive Vocational Maturity Test

Area Subtest 5: Attributes Required
Grade 9 (N=926)

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Item Number	Correct Response	Difficulty Index	Point Biserial	Number Choosing Each Response				
				1	2	3	4	5
76	1	.92	.59	849	26	29	13	9
77	2	.85	.50	56	783	38	34	13
78	3	.87	.49	33	35	805	24	26
79	3	.90	.64	21	34	831	25	12
80	2	.90	.58	25	830	28	35	6
81	1	.79	.46	727	25	114	42	16
82	4	.86	.61	17	24	77	798	9
83	4	.85	.61	66	35	26	784	14
84	1	.84	.69	780	34	68	25	18
85	1	.82	.60	759	33	85	40	6
86	4	.82	.62	22	66	69	756	9
87	3	.78	.57	104	49	722	33	14
88	4	.68	.53	40	43	168	624	48
89	1	.86	.65	790	32	25	41	36
90	1	.70	.52	647	215	39	16	7
91	1	.73	.57	678	138	36	37	34
92	2	.55	.33	326	506	36	16	38
93	2	.35	.14	232	318	104	234	33
94	2	.76	.55	27	701	79	59	55
95	3	.77	.55	112	42	714	44	11

Cognitive Vocational Maturity Test

Area Subtest 6: Duties
Grade 9 (N=926)

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Item Number	Correct Response	Difficulty Index	Point Biserial	Number Choosing Each Response				
				1	2	3	4	5
96	4	.90	.56	15	45	28	828	3
97	3	.84	.50	40	64	779	29	12
98	2	.86	.52	66	797	28	25	6
99	2	.87	.51	21	800	45	48	9
100	1	.84	.53	774	39	54	35	19
101	3	.83	.53	48	30	772	67	8
102	1	.84	.55	777	35	76	21	15
103	1	.74	.37	686	33	66	119	21
104	1	.73	.56	671	76	128	13	35
105	3	.86	.57	26	55	799	40	4
106	2	.82	.52	22	757	113	23	8
107	1	.77	.49	714	85	40	40	43
108	3	.67	.52	35	56	617	201	14
109	4	.66	.46	29	134	130	610	21
110	4	.78	.56	28	101	46	725	24
111	3	.74	.54	147	42	678	46	7
112	3	.66	.48	172	86	605	27	31
113	4	.64	.53	50	69	121	590	90
114	3	.76	.58	40	110	705	39	28
115	2	.54	.45	99	499	164	105	54
116	4	.61	.55	24	107	186	562	44
117	2	.65	.56	45	599	74	120	78
118	4	.68	.56	105	73	100	624	19
119	1	.60	.50	555	208	108	38	13
120	4	.56	.49	43	154	145	514	57

APPENDIX H

EXAMINER'S MANUAL

FOR THE

COGNITIVE VOCATIONAL MATURITY TEST

Introduction

This manual has been prepared to describe for you, completely and specifically, the standard procedures to be followed in administering the Cognitive Vocational Maturity Test.

It is most important that you follow all the directions exactly. Norms can be used with confidence only if the tests are administered under strictly uniform conditions in all of the participating schools. Uniformity of administration increases the accuracy and dependability of the results.

Before giving the test, you should become thoroughly familiar with the test booklets, answer sheets, and other materials, and you should read this entire manual carefully. If you read this manual carefully at least twice, you should not have any difficulty administering the tests.

Need for the Cognitive Vocational Maturity Test

The Cognitive Vocational Maturity Test has been designed to provide some objective measures of each pupil's level of career and occupational development, including occupational information and planning. With these kinds of information, it should be possible to provide guidance to pupils with respect to their career and occupational development.

It should be emphasized that students should not attempt to "cram" for these tests. Also, it is impossible to judge the work of any individual teacher based upon these test results. Furthermore, while these tests presumably measure a number of important aspects of career and occupational development, not all aspects of that development will be measured by these tests.

Preparation for Testing

Physical Arrangements

Several days prior to the administration of the test, plans must be made for how the pupils may be best organized for testing. In some schools, each teacher will give the examinations in the homeroom. In other schools, the students may be tested in larger groups. If students are tested in large groups, it is extremely important to have a sufficient number of proctors to assist in the administration of the tests.

Careful planning for the testing should include a consideration of the following: adequate lighting, good ventilation, adequate writing

space, and freedom from crowding. Each student must have a smooth working surface, room to handle a 8½ x 11 test booklet and an answer sheet of the same size. Also, the less crowding of students in the testing room, the less opportunity there will be for copying.

Selection of Proctors

It is especially important that the students have close and constant supervision throughout each testing period. There should be one adult proctor (including an examiner) for every 30 students. Those appointed to such duties should be able to encourage the students to do their best work and to maintain discipline.

Examiners and proctors should check throughout the entire testing period to see that the students are using the answer sheets properly, that they are making dark, black marks, not making double marks or extra marks, and that they erase completeiy if they change an answer. In addition, proctors and examiners must ensure that students do not make extra marks on their answer sheets. Extra marks, although very light, will interfere with the accurate scoring of their test because the test scoring machine will read extra marks and stray marks as intended responses. Stray marks and extra marks will cause the test scoring machine to stop so often that it will be virtually impossible to score accurately the answer sheets.

Examiners and proctors must account for every test booklet and answer sheet given to them for each testing session. This must be done before the students leave the room.

Examiners and proctors should not talk to each other while testing is going on, since this may interfere with the student's concentration.

Time Schedule for Administering the Test

The Cognitive Vocational Maturity Test should be administered in two testing sessions. This can be done easily in two 40-45 minutes class periods. Part I (items 1-54) should be administered during the first testing session. Part II (items 55-120) should be administered during the second testing session.

A recommended time schedule is presented here for use in administering the tests in two testing sessions on different days.

FIRST TESTING SESSION (TUESDAY or WEDNESDAY)

9:00 - 9:15	Distribution of materials and reading directions.
9:15 -	Students begin working on Part I of the Cognitive Vocational Maturity Test.
9:45 -	Students stop working on Part I of the Cognitive Vocational Maturity Test.
9:45 - 9:50	Students are instructed to examine their answer sheets carefully and to erase all stray marks. Examiner collects all test booklets and answer sheets before dismissing students.

SECOND TESTING SESSION (WEDNESDAY or THURSDAY)

9:00 - 9:15	Distribution of materials and reading directions.
9:15 -	Students begin working on Part II of the Cognitive Vocational Maturity Test.
9:45 -	Students stop working on Part II of the Cognitive Vocational Maturity Test.
9:45 - 9:50	Students are instructed to examine their answer sheets carefully and to erase all stray marks.
9:50 -	Examiner collects all test booklets and answer sheets before dismissing students.

Advance Announcement of the Testing Program to the Students

The matter of prior announcement of the testing to the students is of particular importance because the motivation and attitude of the students toward these tests will significantly affect their usefulness for educational guidance and evaluation. Do not over-emphasize the importance of these tests, since some students may become so anxious and tense that they cannot perform up to their usual level of ability. On the other hand, if no advance notice is given, some students may become upset. Give the tests as much advance "publicity" as any other phase of the school routine. Indicate to the students that they will benefit from these tests because it will be possible to determine some of their strong points as well as weak points in their school preparation to date, that you will learn something about their aptitude for areas in which they may or may not now be interested, that you will be able to adapt your instruction and guidance to their individual needs and that you will be able to compare them with other students in the same grade not only in their own school but in other schools in North Carolina.

It is the job of each teacher to see to it that each student does his best, without anxiety, during the testing period and that he makes no special outside preparation in the hope of improving his test scores.

Materials Needed for Each Student

1. Cognitive Vocational Maturity Test

2. Answer Sheets for IBM 1230 Optical Marking Reader

3. Pencils and erasers (Since the answer sheets will be machine scored, students must use pencils in marking their answer sheets. Special pencils are not needed as long as students make heavy black marks on the answer sheet. Since No. 3 pencils do not generally make heavy black marks, they must not be used. You should be prepared to provide No. 2 pencils for students who do not have them. You also should be sure that each student has a good eraser. Otherwise the student cannot erase properly, and he may wear a hole in the answer sheet.)

INSTRUCTIONS TO STUDENTS

First Testing Session

(Note to examiner: Instructions which are to be read aloud to students appear in the boxes. Other instructions are intended only for the examiner.)

The examiner should be sure that students have been seated in the desired arrangement and that they are separated as much as the room will allow.

THEN SAY,

> Today you are going to begin taking a special test. The purpose of this test is to give both you and your teachers a better picture of your career development. This information will help us find out what progress you are making.
>
> The test results can be of real value to you in working out your educational and occupational plans. However, the results will be valuable to you only if you do your very best on the test. If you do not make a sincere effort, the scores will not provide an accurate picture of your knowledge, and the time spent in taking the test will be wasted.
>
> This test will be given in two testing sessions. The first testing session is today, and it will last approximately 45 minutes. The second testing session will be tomorrow; it will also last approximately 45 minutes.
>
> Each of you must use a pencil to mark your answers on the answer sheet. Since the marks on your answer sheet must be heavy and black, it is important for you to use a No. 2 pencil with a good eraser. Please raise your hand if you need a No. 2 pencil or an eraser.

At this time you should distribute pencils to any student who does not have a No. 2 pencil and a good eraser.

When you have determined that every student has a No. 2 pencil, THEN SAY,

> We will now pass out the test materials for this testing session. Do not open your booklet until you are told to do so. Do not make any marks on the test booklet or answer sheet until we tell you to do so.

Distribute booklets and answer sheets. THEN SAY,

> Turn your answer sheet to the side which has space to put your name, date, age, sex, and date of birth on the top line.
>
> Please PRINT your last name, then your first name, then your middle name.
>
> (PAUSE)
>
> Beside "date" write today's date, which is _____.
>
> (PAUSE)
>
> Beside age, write in your age on your LAST birthday in years.
>
> (PAUSE)
>
> Beside sex, write an "M" for male or "F" for female.
>
> (PAUSE)
>
> Beside date of birth, give your month, day, and year of birth (in numbers). For example: 10/4/54.
>
> (PAUSE)
>
> Beside the word "school," print the name of our school, which is _____, the city, and the grade you are in _____. (Write the number of the grade.)

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Beside the words "Name of Test" PRINT the initials CVMT, which stands for Cognitive Vocational Maturity Test.

(PAUSE)

Pause and check to see that students have filled in information correctly on their answer sheet and that they have not made stray marks.

Now I would like for you to read the directions on the front of the test booklet silently as I read them aloud.

"This is a test of your knowledge of career information. The results of this test may eventually be used to help you choose an appropriate occupation. Your answers must be marked on the answer sheet which has been provided for you. Use only a No. 2 pencil. Do not use a No. 3 pencil. Do not make any stray marks. If you make an error, erase it completely before marking your new answer.

Make no marks in the test booklet.

The following is a sample question to show you how your answers are to be marked. Study the sample and if you have any questions, raise your hand.

(PAUSE)

You should note that your answer sheet is arranged so that the numbers for the questions go across the answer sheet rather than down one column at a time.

For each question there is always one best answer. You should answer as many questions as you can. Do not spend a great amount of time on any one question."

(PAUSE)

I would like to remind you to read each question carefully before attempting to answer it. Do not spend too much time on any one question. If you make good use of your time, you should be able to answer all of the questions in the allotted time. Do not work so fast that you make careless errors. If you make extra marks or stray marks on your answer sheet, it will not be possible to score your answer sheet correctly. If you make an error, be sure to erase it completely before marking a new answer.

Are there any questions about what you are to do?

Pause momentarily to allow questions to be asked. THEN SAY,

You will have 30 minutes in which to answer the questions in Part I of this test. When you finish a page, go right on to the next page. If you finish all the questions in Part I before time is called, you may return to questions in Part I. Do not begin work on Part II. Ready? Begin!

Record the starting time and ending time on the board.

The examiner and proctors (if any) should move quietly around the room to see that each student is marking his answer correctly on the answer sheet. Make certain that students go across the answer sheet rather than down one column at a time. After 30 minutes SAY,

Stop working and close your test booklet.

Now, inspect your answer sheet. Are all your answer marks heavy and black? If not, go over the light ones and blacken them well. Have

you made any accidental dots or marks? If so, erase them. Are any of your erasures "messy"? If you have changed any answers, did you erase the old answers completely? Make your answer sheet clean and neat.

(AFTER SUFFICIENT TIME HAS ELAPSED, SAY,)

We will first pick up the test booklets.

Collect the test booklets, and THEN SAY,

We will now collect the answer sheets.

Second Testing Session

(Note to Examiner. Be sure that students have been seated in the desired arrangement and that they are separated as much as the room will allow.)

THEN SAY,

> We will now pass out the test materials for this testing session. Do not open your test booklet until you are told to do so. Do not make any marks on your answer sheet until you are told to do so.

Distribute booklets and answer sheets. THEN SAY,

> Open your test booklet to page 12. (PAUSE) At the top of page 12 it says, "Part II begins on this page." When I give you the signal, you should begin working with item 55 at the top of the page.

Be sure that everyone is on the right page.

THEN SAY,

> Now look at your answer sheet and find the answer space for item 55. This is where you will begin marking your answers for Part II. Be sure that the number of the answer space is the same as the number of the item you are working on. Are there any questions?

Be sure that each pupil has found the answer space for item 55.

THEN SAY,

You will have 30 minutes to answer the questions in Part II of this test. When you finish a page, go right on to the next page. If you finish all the questions in Part II before time is called, you may return to questions in Part II. Do not go back to Part I. Ready? Begin!

Record the starting time and the ending time on the board.

The examiner and proctor (if any) should move quietly around the room to see that each student is marking his answer correctly on the answer sheet. Make certain that students go across the answer sheet rather than down the answer sheet. After exactly 30 minutes have elapsed, SAY,

Stop working and close your test booklet.

Now inspect your answer sheet. Are all your answer marks heavy and black? If not, go over the light ones and blacken them well.

Have you made accidental dots or marks? If so, erase them completely. If you have changed any answers, did you erase the old answers completely? Make your answer sheet clean and neat.

(AFTER SUFFICIENT TIME HAS ELAPSED, SAY,)

We will first pick up the test booklets.

Collect the test booklets, and THEN SAY,

We will now collect the answer sheets.